Draft: For Discussion Purposes Only

1995 Farm Bill

Policies to Integrate

Agriculture and the Environment

Appendix

U.S. Environmental Protection Agency

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Farm Bill Policy Papers

1. Financial Support and Incentives
2. Farming Systems
3. Land Retirement
4. Marketing
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Disclaimer

These papers are intended to provide a spectrum of options that can help advance environmentally and economically sustainable agriculture policies in the 1995 Farm Bill. These options are provided for discussion purposes only, and they do not represent official EPA policy or positions.

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FARM BILL POLICY OPTIONS
FINANCIAL SUPPORT & INCENTIVES

The following options for financial support and incentives are provided as possible replacements for the existing program of producer support under the current Commodity Programs, the dairy program, the export enhancement program, or the crop insurance programs. They would serve as a linkage between the financial resources allocated under the Farm Program and environmental objectives, as identified in the Clean Water and other environmental acts.

We have decided to use the following policy taxonomy, which leads to two types of policy options: 1) modifications to the existing system and new concepts that can stand alone and 2) policies that do not stand alone but complement options in the first category. Clearly within each category, there can be dozens, if not hundreds, of versions of each option depending upon policy preferences. Listing so many options, however, is impractical. To keep the number to a manageable set, we have used our judgement up to a certain point--that point being where a clear divergence of opinion became apparent across Offices and where a decision is needed of the policy makers.

THE CURRENT COMMODITY PROGRAM

The criticisms of the existing financial incentive programs are that they 1) reward producer behavior for adopting practices, land uses or methods that are inherently environmentally risky or unsound, such as monoculture, cropping on marginal lands, and destruction of wildlife habitat; 2) encourage overproduction and and excessive use of inputs, such as manure, pesticides, and land; 3) cost the taxpayer funds that could be spent on environmental amenities; and 3) lead to inequities. Some of the criticisms of the programs, such as the assertion that they lead to excessive use of inputs, may or may not be valid for all major commodity crops, given the changes and corrections that have occurred in previous Farm Bills. The validity of the charges is being investigated in the ongoing policy research that will be available late this calendar year.

Deficiency Payment Program

Current basic price-supported commodities are wheat, peanuts, feed grains, cotton, and rice. Farmers who have established base acreage (acres that would have grown a program crop) are eligible for deficiency payments. Crop acreage base is based upon a producer's five-year moving average of production for feed grains and wheat. It is a 3-year moving average for cotton and rice. However, program yields for program crops were frozen in 1985. Deficiency payments are paid on the number of bushels produced on 85% of base acreage minus the acres in the acreage reduction program (which varies from year to year). The

payment represents the difference in price per unit of output between the market price, the five month average price around harvest, or loan rate (explained below) and the target price, the output price goal, which is set by Congress. Farmers can grow whatever feedgrain or oilseed crop they wish on the remaining 15% without losing base. However, they do not receive deficiency payments on this production. Farmers must grow program crops each year to maintain base. Furthermore, growers cannot build a new crop base if he or she was eligible to receive deficiency payments for any crop produced on the farm. They hence must drop out of the program to establish a new base.

Subsidies related to agricultural commodities (feed grains, wheat, soybeans, cotton, rice, dairy, disaster payments, export programs):

- o 1992: $9.74 billion
- o 1993 (est.): $17 billion
- o 1985-1992: $115 billion

Deficiency payments (difference between subsidized price and market price):

- o 1992: $5.7 billion
- o 1993: $8.94 billion

The deficiency payment program benefits a large number of farmers, but a small percentage of farmers disproportionately because payment is tied to production. 73% of the program benefits go to the largest 15% of the farms. A major criticism of the Commodity Program is that it encourages production regardless of demand. It may also encourage the adoption of environmentally and agronomically risky agricultural practices, such as monoculture. Inefficiencies caused by the program [Chang, McCarl et al estimate that the program results in roughly a $5 billion deadweight loss to society.], amount to some $5 billion. A more efficient design could allow up to an equivalent amount to be better spent on positive externalities or "joint products." On the other hand, many moderate size producers believe, rightfully or not, that the commodity programs are the only hedge they have against the large grain dealers actually setting "market prices" through their influence on grain markets.

Non-Recourse Loans

There are the following nonbasic commodities for which producers receive different forms of income supports: soybeans, peanuts, tobacco, milk, sugar beets, and sugarcane. Producers of soybeans, for example, are eligible for a nonrecourse loan price support rate, the price at which USDA will provide loans to enable farmers to hold their crops for later sale. It is based upon 85% of the five year moving average of producer prices, excluding high and low years. If market prices are higher than the loan rate, producers can pay back the loan and sell the crop at the higher market price. If the market price is below the announced loan rate, producers can repay the loan at less than the announced rate. Tobacco and peanut prices are supported through marketing orders and quotas; sugar through tariffs and

import restrictions; and dairy producers are supported through a system of marketing quotas on fluid milk that, together with federal purchases of storable surplus dairy products, maintain a floor for milk prices.

Crop Insurance Program

The current voluntary crop insurance program is based upon an individual farmers' annual yield and not the likelihood of crop loss within a production area. Premiums, which are federally subsidized, depend upon the level of protection desired. Total paid for premiums amounts to about $500 million per year with the Government share about $200 million. Total Federal funds paid out to farmers for crop insurance amounts to about $1 billion per year. Utilization of the program by producers tends to be concentrated in certain geographic areas. Anticipation of disaster relief, for which producers pay nothing, works against participation in other areas. Disaster relief, an off-budget Federal expense, averages about $1 billion per year.

There is currently a proposal under consideration on Capitol Hill to reform the Federal Crop Insurance Program. The outlook for this Bill is relatively favorable -- passage is anticipated some time this summer. The proposal has three components:

1) Removal of ad hoc disaster assistance -- making crop insurance the primary source of compensation,

2) Catastrophic coverage offered to growers for a processing fee of $50/crop up to $100/farm. This plan will cover yield losses in excess of 50 percent at a payment rate of 60 percent (additional coverage can be obtained). Participation in this program will be required to participate in other farm programs.

3) The Non-insured Assistance Program (NAP) covering any food and fiber crop -- this would apply when there is a 65 percent yield loss at the county level. Levels of protection would be similar to those under the catastrophic coverage plan.

Export Enhancement Program

Under the Export Enhancement Program, the USDA pays cash to exporters (as bonuses) which enables them to sell U.S. agricultural products in targeted countries at prices that are below the exporters cost of acquisition. Targeted countries are those countries in which U.S. sales have been non-existent, displaced or reduced due to competition from subsidized exports from other countries. The program was initiated in 1985 and was reauthorized in the 1990 FACTA. Under the 1990 legislation, the Commodity Credit Corporation (CCC) is to disburse (at a minimum) $500 million per year to implement the program. The following commodities are covered under the program: wheat, wheat flour, semolina, rice, frozen poultry, barley, barley malt, table eggs and vegetable oil. Similar programs are being implemented that cover dairy products, sunflower seed and cottonseed oils. Exporters of the above commodities must meet specific criteria to participate in the program.

OPTION SUMMARY

I. ALTERNATIVE STAND ALONE OPTIONS

Option 1: Baseline Plus The baseline-plus option is a modification of the existing Commodity Program that would strengthen the existing stewardship components and result in greater environmental benefits. It would contain the following provisions: 1) increase the percentage of base acreage upon which alternative crops can be grown without losing base; 2) continue the current Cross-Compliance program for soil erosion, as well as the Swampbuster and Sodbuster programs; and 3) require compliance with CZARA or Clean Water Act management measures where they apply. It also contains one of the following "add-on" programs: **A) introduction of the program of Stewardship Payments** (annual payments for positive environmental activities resulting in measurable benefits) or **B) Management Measure Cost-share** (one-time or annual payments that would be made to farmers to offset the cost of meeting regulatory management measures, cross-compliance costs, or other mandatory program requirements); or **C) Super-Compliance** (an expansion of current cross-compliance programs to cover the use of factor inputs, such as nutrients and pesticides, through nutrient, pest management, or even irrigation plans).

Additional incentives to remain in the program could be made through creative use of set-aside requirements. Farmers would be excused from set-aside requirements, or some portion thereof in exchange for the adoption of stewardship practices or management measures. Alternatively, set-aside acreage could be targeted to provide maximum environmental benefits. This provision would allow farmers in the commodity program with environmentally sensitive land to sell their "production rights" on base acres to farmers in the commodity program with less sensitive land. In essence, this provision would take environmentally sensitive base acres out of production in exchange for production on set aside acreage that is not environmentally sensitive.

Implementation Issues

The stewardship component would be relatively politically palatable to keep producers in the program and to encourage the adoption of sustainable agricultural systems, rather than specific practices that address only single objectives. It also has the benefit of being consistent with the negotiated GATT text regarding agricultural subsidies. A management measure cost-share would more closely link Farm Income Support to the meeting of EPA water quality objectives. The program would be more closely targeted towards impaired watersheds with clear water quality problems associated with agriculture. However, it would be a redirection of funds away from income support and hence would not be politically popular among producers, particularly those not in targeted watersheds. A cost-share program could effectively reimburse the capital costs of implementing management measures, but may not perform as well as a stewardship program at reimbursing other costs (e.g., opportunity costs, and forgone revenue). It can also lead to problems of moral hazard--incentives for producers to wait for cost-share before implementing management measures

rather than independently adopting them where necessary at their own expense. A Supercompliance would more broadly tighten the environmental requirements for income subsidies, not just for producers in targeted watersheds as under a management measure cost-share program. However, it would also lead to a diminution in the number of program participants. EPA would likely have less influence in the implementation of a supercompliance program than a targeted program of sharing the costs from the implementation of CZARA or CWA management measures. The provisions for environmental uses of set-aside would become moot if GATT mandates the elimination of the set-aside provision therein removing incentives to participate in the program.

Option 2: Stewardship Payments (Alone). Payment would represent the opportunity cost of providing the positive externality (e.g., wildlife habitat benefits, soil conservation, wildlife beneficial crops, winter cover crops, tree planting, and water-quality-related benefits). If structured properly, the payments could provide farmers with more autonomy than the other options (and hence encourage greater involvement in issues of environmental protection and agricultural production). They could thus provide the incentive to look for creative solutions more in line with principles of ecosystem management than one-time payments to cover regulatory costs. It can be designed to meet multiple objectives, such as habitat **and** qroundwater protection **and** surface water protection. Payments could also be related to the implementation of more limited-focus management measures under CWA or CZARA. Stewardship payments would apply to producers both in and outside the existing Commodity Program. One component of this option could be payments for energy feedstock production (biofuels). A Biofuel Reserve Program would deliver production incentives through a bidding system whereby farmers needing smaller incentives are accepted into a subsidy program earlier than farmers submitting higher cost proposals.

At least a portion of the cost of a stewardship payment program, particularly for the adoption of safer pest management practices, could be offset by a chemical pesticide fee, as well as a similar tax on chemical fertilizers.

Implementation Issues

This option presupposes a new administrative structure for determining what benefits would be purchased and the price that would be paid. Also, any redistribution of existing funds away from current recipients would be politically difficult. The biofuels component could be administratively difficult, but would support the administration's Global Climate Change Initiative. Any taxing scheme, particularly if the tax is borne by producers, to provide an alternative source of funding would be resisted by the Congressional committees that traditional deal with agricultural issues.

Option 3: Revenue Assurance/Insurance Farmers in the current Commodity Programs are assured a percentage, such as 70% (the revenue target), of the running average of their previous five year revenue or of per acre returns. Assurance means that the farmers do not pay for coverage. With an insurance option, they would be required to pay a (subsidized)

premium for coverage. As a condition of either program, they are required to implement pesticide, nutrient and soil management plans, as under the Supercompliance option. It would remove disincentives to rotate crops (resulting in certain environmental benefits) and could lead to a streamlining of deficiency, disaster, and crop insurance programs. To strengthen this option environmentally, federal crop insurance could be made available to underwrite farmers' financial risk of undertaking production practices which mitigate pollution or risk relative to typical practices. This option assumes that financially sound sustainable practices have been (or could readily be) defined on a crop specific basis.

Implementation Issues

Revenue assurance would be more expensive for the Government than insurance; hence, budgetary concerns would need to be resolved. The revenue insurance option raises the question of actuarial soundness and at what level premiums should be subsidized. Cost of the program, and hence the political support from producers, depends on what level of income support it would provide. Also, farmers are generally opposed to "welfare-type" payments.

II. ALTERNATIVE OPTIONS THAT DO NOT STAND ALONE

Option 4: Export Enhancement Program Targeting. In meeting our obligations under the GATT, the U.S. will have to reduce export subsidies over the implementation period. USDA could target these reductions at most environmentally damaging crops (i.e., sugar, milk, peanuts and cotton). This option could also be stated as: continuation of export subsidies for crops that have been produced in an environmentally sound manner. Political and implementation issues (such as monitoring and enforcement) would need to be resolved.

Option 5: Cross-Compliance for the Dairy Program. This option assumes that the Clean Water Act will be reauthorized with "CZARA type" requirements for management measures in targeted watersheds. Participants in the Dairy Subsidy Program would receive price supports only on condition that their operations are in compliance with management measures for nutrients. The incentive would be lost in years when milk prices exceed the support price.

Option 6: Underwriting Risk of Pesticide Use/Risk-Reduction options. The Federal Government underwrites farmers' financial risk of undertaking production practices which mitigate pollution or risk relative to typical practices. Two suboptions are proposed: one where the risk would be reduced through underwriting of crop insurance by private insurers and the other through guaranteed loans for the purchase of necessary equipment. Both suboptions presuppose existence of sustainable practices that are financially sound. The eligible production practices would include a) sustainable agriculture practices, b) crop/pest-specific use of area-wide IPM, and c) crop/pest-specific use of safer pest management practices, which mitigate pollution or risk relative to typical practices. The program could

be difficult to set and administer initially. Costs at the outset would likely be greater than later on.

Option 7: "Green Loans" to Farmers to Purchase Technology That Achieves Pollution or Risk Reduction

This option would make more capital available for loans by direct government loans for the purchase of promising new, "greener," technologies or would underwrite the risk of loans made by private banks for such technologies. Traditional sources of funding, such as banks, are averse to providing funds for technologies that are not standard farming practice because of the perceived added risk to the collateral (i.e., the farmer's crop). A new program that does not have clear or powerful constituency could be politically difficult to establish given current budget constraints.

DISCUSSION OF THE POLICY OPTIONS

The policy options that were considered by the workgroup range from stand-alone modifications to the existing program to major redirection of agricultural policies--new programs. We describe and evaluate the various options below.

I. STAND-ALONE OPTIONS

1) Baseline Plus

The baseline-plus is a modification of the existing Commodity Program to make it greener. It could serve as a transition program from the current deficiency payment (entitlement) program to a program that compensates farmers for the costs of providing environmental amenities--a transition that could take place over one or more Farm Bill periods. Baseline Plus cushions the transition away from an entitlement program for production of commodity crops to a budgeted agricultural and environmental joint-product program. It is characterized by the following:

o Increase base acreage flex. Producers would be paid a deficiency payment on a smaller percentage of the existing 85% of base, such as 75%. The advantage would be a removal of any further disincentive to rotate crops and a creation of an incentive to produce according to market demand. It would also reduce total deficiency payments. Alternative would be to have 100% flex with payments on 75% of whatever combination of commodity crops are grown.

o Requirement for adoption of CZARA or Clean Water Act management measures, where they apply.

In addition, it contains any of the following add-on programs.

1A) Introduction of the program of Stewardship Payments or Incentives (annual payments for positive environmental externalities or benefits).

-As here defined, stewardship payments are <u>not</u> cost-share payments for implementation of mandatory management measures to meet regulatory standards. Instead they are payments that cover at least the opportunity cost (income foregone) of the adoption of stewardship practices or management measures.

- Stewardship Payments would serve as compensation for environmental benefits beyond those represented by CZARA or Clean Water Act management measures (MM). They could be in the form of either cash or program equivalents. Program equivalents could be credits for set-aside acreage or crop acreage credits for adoption of management measures that

involve idling land, such as fallow in a crop rotation. They cover at least the opportunity cost of implementing farming systems that protect water quality, improve soil quality, and provide other environmental benefits as well, such as wildlife habitat and reduced human exposure to pesticides.

- Funds that are freed up by reductions in the cost of the program of commodity deficiency payments (such as through changes in the payment formula) could serve as the basis for the Stewardship Payment program.

Pros and Cons

Environmental benefits

Baseline Plus would tend to correct some of the remaining distortions of the current Commodity Program that adversely affect the environment. At the same time, it would target funds towards the purchase of positive externalities. On the other hand, as the conditions on receiving deficiency payments increase, farmers could opt out of the program. Nevertheless, farmers who opt out would still be subject to CZARA or Clean Water Act MMs. The Stewardship Payment provision could apply to producers both in the program and without.

Implementation

The Stewardship Payment provision must have clearly defined and measurable products and assumes an administrative structure for determining products. There is precedence for a Stewardship Payment program. A number of states are now providing a Stewardship Payment to producers to provide environmental benefit, such as a set-aside of crop acreage for migratory bird habitat. There is also the administrative precedence in the ASCS, local soil conservation districts, or Great Lakes or Chesapeake Bay cost-share programs, whereby local authorities must determine the merits of cost-sharing structural improvements. In this case, the focus would be on farming system improvements rather than structures. See the description and discussion of the Stewardship Payment option.

Political feasibility

Politically, this would be the most palatable environmental option from the perspective of producers, though, depending how the program were implemented, it could lead to a shift away from an entitlement program. Baseline Plus could represent a gradual shift and not one that would cause major discomfort in the farm community if the bulk of the funds remain with the current recipients. In fact, conservative ag staffers have mentioned a version of Baseline Plus as a possible compromise for a greener Farm Bill. Environmentalists, who generally support the general concept of Stewardship Payments, would see Baseline Plus as a shifting over towards a greener agricultural policy.

Budget

The option would not likely result in a major change in revenue to farmers in general, depending upon how the Stewardship Payment option is constructed and how much money is available, though it could cause a redistribution of funds. A program that paid farmers in program credits would have little direct budget impact. Nor would it lead to major government expense since OMB sees commodity payments, CRP, Wetlands Reserve Program or even a future Stewardship Program as constituting one larger pot of money. Conception of the Stewardship Program as a variation in the entitlement program could provide a stronger OMB or Hill argument for continuation of the existing budget. Nevertheless, the notion that it would shift ag payments away from an entitlement program to a budget line item that is controllable is more of perceived problem from the point of ag interests than a real problem from the perspective of OMB.

1.B. Management Measure Cost-share

- One-time or annual payments would be made to farmers to offset the cost of meeting regulatory management measures, cross-compliance costs, or other mandatory program requirements.

- Funds would be targeted to impaired watersheds.

- The MM cost-share would be made available in lieu of a Stewardship Payment program.

- Reduction in the Commodity Program Acreage Set-Aside Requirement or a planted acreage credit could substitute for a dollar amount.

Pros and Cons

Environmental benefits

Cost-share funds would be targeted towards meeting explicit environmental objectives in a few areas rather than broad-scale. The result is that farmers in the targeted areas would be more likely to implement the measures, with corresponding greater site-specific environmental benefits. However, the existence of a cost-share in impaired watersheds could lead to the problem that economists call Moral Hazard. Farmers decide to wait to implement more environmentally sound management measures, if they cost more, rather than doing them on their own, in anticipation of federal funds to offset their cost. The result could be an actual worsening of the environment in watersheds which do not receive the cost-share. Cost-share generally work better for management measures that involve one-time capital costs.

Implementation

The existence of a pot of money contingent upon the organizational structure for deciding and enforcing management measures could provide a strong incentive for the states and local authorities to develop the necessary watershed planning bodies. There is also the administrative precedence in the ASCS, local soil conservation districts, or Great Lakes or Chesapeake Bay cost-share programs, whereby local authorities must determine the merits of cost-sharing structural improvements.

Political feasibility

Agricultural interests and powerful Hill legislators are not likely to support a cost-share program to support CWA non-point source implementation where the bulk of funds come from the traditional commodity income support program. Particularly since it could lead to a major redistribution of funds away from their districts. Farm organizations, such as the National Corn Growers, Pork Producers' Association, or National Farmers Union will not support a "reward" for polluting since it could lead to conflict within those within their organizations. The conflict would arise between those producers who benefit because their farms are located in impaired areas and those who are being pressured by state and community interests to change their practices but who would not get the cost-share because of where they are located.

Budget

The option would not likely result in a major change in revenue to farmers in general, depending upon how the cost-share program is constructed and how much money is available, though it could cause a redistribution of funds. Nor would it lead to major government expense since OMB sees commodity payments, CRP, Wetlands Reserve Program or even a future Stewardship Program as constituting one larger pot of money. It could provide a stronger OMB or Hill argument for continuation of the existing budget. The notion that it would shift ag payments away from an entitlement program to a budget line item that is controllable is more of perceived problem from the point of ag interests than a real problem from the perspective of OMB. Cost sharing is generally more appropriate where capital costs are involved, rather than income foregone. This is because the opportunity cost of a farming system, such as a sustainable crop rotation, may be greater than its increased cost over the more conventional practice.

1C. Super-Compliance

This option represents a higher quid pro quo for recipients of federal commodity subsidies. It would expand the Conservation Compliance Program, which is now a component of Baseline Plus, to include requirements for nutrient and/or pesticide and/or irrigation plans and recommendations, as specified in our management measures, in addition to current environmental requirements. The Soil Conservation Service would expand their duties from development and enforcement of soil conservation plans on highly erodible land to development and enforcement of total resource management plans.

Environmental Outcomes:

The environmental benefits would depend upon the nature of the management measures specified, the percentage of producers who opt to remain in the commodity program despite the increased costs associated with doing so, and the ability of authorities to enforce. The more measures to which a producer is likely to be subject, the less likely he or she will continue in the program without an increase in the commodity payment. Currently, the most specific, and therefore, strongest management measure is for nutrients, which represents the most pervasive water quality and health risk from agriculture, and adds to global gas emissions into the atmosphere. Pesticides currently represent a more complex and costly problem to address, as reflected in the less specific management measure. The irrigation management measure is stronger, but many irrigated crops are not in farm programs and therefore might not be influenced by this farm bill option. However, there could be a tradeoff in adverse environmental effects from production by producers who opt out of the program.

Budget:

This option would produce budget savings, rather than costs, as some farmers might drop out of the program rather than comply.

Farmer Costs:

The impact on farmer costs will depend upon which management measure he or she is subject to. The nutrient management measure for fertilizer use could reduce costs and increase net income, if implemented in concert with well designed research and education programs. On the other hand, the measure for manure is likely to decrease farm income. Reporting requirements could be particularly burdensome despite farmers complaining about existing burdens.

Administrative Feasibility:

As with set-asides and stewardship payments, this option would need to specify management measures that can be easily tracked to verify compliance; entire erosion and chemical

management plans tend to be quite difficult to enforce. Denial of payments represents a heavy hammer, which will put more pressure on administrators to come up with effective/equitable enforcement procedures. There is little confidence that Soil Conservation Service are able or willing to become environmental police. The reporting requirements could cause administrative problems.

Political Feasibility:

Powerful commodity and industry groups presumably would oppose this option, although it might be favored by some farm bill players as a budget cutting measure. USDA would not be interested in assuming EPA's role in enforcing environmental regulations if the benefits are not clearly seen to lie with producers. On the other hand, if regulations are inevitable, they would prefer that they, rather than EPA, have the responsibility for enforcement. The environmental community, however, would not trust USDA to develop and implement an effective enforcement program.

II. OPTIONS THAT REPRESENT NEW STAND-ALONE PROGRAMS

1) STEWARDSHIP (ANNUAL) PAYMENTS OR INCENTIVES

This program replaces the current program of income support and presupposes termination of the existing commodity program. The stewardship payments would cover the opportunity cost (income foregone) and possibly also a premium high enough to induce producers to agree to adoption of an agricultural practice or system that produces a positive externality. Examples of positive externalities include habitat benefits, soil conservation, wildlife beneficial crops and practices, winter cover crops, and water-quality-related benefits. An additional benefit could be food with fewer pesticide residues. If structured properly, the payments could provide farmers with more autonomy than the other options (and hence encourage greater involvement in issues of environmental protection and agricultural production). They could thus provide the incentive to look for creative solutions more in line with principles of ecosystem management than one-time payments to cover regulatory costs. The service could be related to a management measure under CWA or CZARA. It can be designed to operate so as to meet multiple objectives, such as habitat **and** qroundwater protection **and** surface water protection.

(This option could also serve as a pilot program in a identified watershed or production area.)

In the Stewardship Payment option, producers are paid an **annual** fee according to the environmental service they provide. In general, the service supports the watershed protection or production area plan for water and environmental quality. For certain services, which are national or regional in scope, such as migratory bird habitat, the fee is determined nationally. The service must be demonstrable, such as habitat or cover. The fee would be determined on the basis of the opportunity cost of providing the service over conventional practices in the area or region.

The contracts for Stewardship Payments must be established prior to the Federal budgetting cycle. The same budget or a complementary budget would be established for annual purchases of set-aside. Thus, with funds from the set-aside budget, local authorities could decide either to use the funds to purchase set-aside rights or to pay farmers for use of practices that reduce total production by a commensurate amount.

There are two conditions for receipt of stewardship payments: 1) the existence of regional or national plan for protection of a environmental resource, animal or bird species of national value, or other ecological good; and 2) a watershed protection plan that includes areawide land use or required management measure under CWA or CZARA. The program is voluntary and serves to compensate farmers and landowners for services and goods that benefit the public domain. These benefits are both environmental **and** economic.

For example, in an area of essential, non-renewable and declining groundwater resources,

the service is a practice that, in comparison to conventional practices, reduces the draw upon the ground water supply or serves to protect recharge. The producer must demonstrate that the practice provides environmental benefit and costs more than the average cost of conventional practices in the area for the production of the same or similar crops.

In a second example, a national or regional plan is established to increase the numbers of an endangered species. A farmer agrees to change his cropping practices, as compared to conventional practices in the area or region, to provide for habitat for the species. State Extension determine the opportunity cost of the new practice. At the beginning of or end of the year, demonstration of the utility of the practice in benefiting the species can come through certification by wildlife experts.

There could be at least two payment options:

(A) payments would be made directly to farmers per benefit unit in grants-like review process

(B) payments would be made to local watershed-level or other decision-making authority, such as a ASCS council or soil conservation district as part of or contigent upon watershed, resource-management plan. Payments could also go directly (rather than through local authority) to farmers where watershed management plans specify responsibilities of farmers.

At least a portion of the cost of a stewardship payment program, particularly for the adoption of safer pest management practices, could be offset by a chemical pesticide fee. A similar tax on chemical fertilizers could also be used to finance the program. This modification of the stewardship program for financing through taxes on inputs is described in greater detail in the appendix.

Pros and Cons

Environmental Benefit

The environmental benefits, particularly to all media, can be the greatest of all options because Stewardship Payments allow purchase of the most preferred behavior with maximum environmental benefit. For example, if more habitat for such-and-such a bird species is desired and a farming system would provide more habitat, the option allows annual purchase of the farming system. The option can be made to complement environmental legislation by making an Stewardship Payment conditional upon a CWA or CZARA watershed plan. Measurability of the benefits would depend upon how the program is implemented. The problem of measurability applies to all other options that attempt to influence agricultural practices rather than just taking land out of production. Stewardship Payment allows the possibility of future payments being made conditional upon the meeting of performance standards that are designed to be measurable.

Ease of Implementation

Enforceability is difficult for any option that seeks to bring about a change in practices that are not entirely structural. Certain practices, however, are readily observable. For example, intercropping can be readily observed by an agent from a road or from the air. Fertilizer or pesticide record-keeping can be cross-checked with sales information. Pesticide record-keeping is already a requirement for restricted use pesticides. In targeted watersheds, a similar requirement could be set.

Political Feasibility

At national forums, both Republican and Democratic Congressional ag staff members have expressed support for a Stewardship Payment-like option as an alternative to or supplement for the current Commodity Program. Farm organizations, such as National Corn Growers Association and National Farmers' Union have expressed cautious interest in the concept, but are concerned about the ability to ensure future funding for the program.

The Stewardship Payment program could complement the watershed-based administrative structure envisioned for the Clean Water Act. Moreover, it would give the watershed concept the economic carrots to realize the implementation of a watershed plan.

Budget

The cost of the program would more controllable than the current Commodity Program because the amount available for Stewardship Payments would be budgeted whereas the existing Commodity Program works as an entitlement. Future funding could be assured through establishment of a tax on selected agricultural inputs (though this is not part of the current proposal), such as chemical fertilizers or synthetic pesticides.

Farm income could actually increase under Stewardship Payments. Analyses of the elimination of the current Commodity Program for corn suggest that, with land retirement kept the same, feed grain producers would lose only about $1 billion in revenue from a loss of the current $3-4 billion deficiency payments. A $2 billion Stewardship Payment program could, depending upon the cost of the services for which they are paid, actually make producers just as well off financially as they are now. It could be a plus to producers by improving the land investment and hence increasing its economic value.

1A: BIOFUEL FEEDSTOCKS

There is new interest in the Administration in promoting bioenergy as an important component of the nation's energy mix. Developing a reliable supply of "Agri-power" products are an important part of this effort. The Farm Bill provides a vehicle to encourage and support the production of bioenergy feedstocks from farm land through Stewardship Payments or through a bidding system like that used in land retirement programs. As

bioenergy feedstocks are currently not competitive with fossil fuels in most cases, incentives will be needed to affect market penetration.

The Farm Bill could support energy feedstock production by adding that activity as an eligible farming practice to receive Stewardship Payments. Both woody and herbaceous biofuel crops can be supported under these vehicles, on the basis of a subsidy per kwh.

Pros and Cons

Implementability

Political feasibility.

There is high interest within the White House and the Executive Offices of the President for a bioenergy program. They will likely support such a program in Congress and with the various agencies and departments involved. Farm communities may resist the concept of Stewardship Payments, seeing existing crop support payments as an entitlement. USDA may resist the concept to some extent, although they are involved in the current White House/OSTP process. Significant limitations exist in terms of targeting biofuels options: herbaceous and woody crop delivered prices are very sensitive to hauling distance. Proximity to potential energy facilities is important and likely to influence the design of the program.

Administrative ease

The Farm Bill process would have to produce an act that included a Stewardship Payments program which would include biofuel production as an eligible practice. Sufficient experience with this type of program exists within USDA to make the program successful. USDA can call upon its Office of Energy to support the program, in addition to its offices that traditionally run its land management programs.

Likelihood of other Federal agencies supporting the option

DOE and USDA are already involved in exploring bioenergy options, and both have a lot to gain from participation in such an initiative.

Degree of regional flexibility

Implementation may be targeted to lands most suited to producing high yields of the targeted crops, and that are within a given distance of energy facilities that can use the crops. The North Central, Northeast, South Central and Southeast regions are likely to be targeted first. Regions with existing wood resources may also be targeted as these resources can be used by energy facilities awaiting harvest of the dedicated fuelstocks.

Costs

National budgetary implication

Costs should be negative or neutral with regard to current federal budget outlays. Funding would come from a percentage of existing annual Farm Bill subsidies re-allocated in to the new programs. Administration costs are likely to be slightly higher than existing costs for program delivery, at least until the programs are well established.

Cost to farmers

Farmer outlays may be slightly higher initially for establishing both types of crops but costs will fall thereafter as maintenance costs for woody crops are low and re-establishment of herbaceous crops unnecessary.

Environmental impacts to all media

Feedstock production will be very effective in reducing soil erosion and reducing nitrogen loads in streams. Woody crops are managed on rotations of six or more years, while herbaceous crops (like switchgrass) are harvested every year after an initial 2-3 year development period, but maintain and build on their extensive root systems in between harvests. In addition, carbon sequestration reduces net greenhouse gas emissions and the biofuels replace some percentage of fossil fuel burned for energy, further reducing net greenhouse gas emissions and reducing air pollutants associated with burning coal and oil. Since at least some biofuels are more resistant to periodic flooding, there would not be the need for levees as exists now for the growing of conventional commodity crops.

Extent to which results can be measured

A measurable result will be the acres of land put into biofuel production, and the number of acres that remain in those uses after the first harvest of those crops. In addition, water quality, soil erosion rates, carbon sequestration, and fossil fuel displacement can be measured.

2. REVENUE ASSURANCE/INSURANCE

Farmers in the current Commodity Programs are assured a percentage, such as 70% (the revenue target), of the running average of their previous five year revenue or of per acre returns. Assurance means that the farmers do not pay for coverage. With an insurance option, they would be required to pay a (subsidized) premium for coverage. As a condition of either program, they are required to implement pesticide, nutrient and soil management plans, as under the Supercompliance option. It would remove disincentives to rotate crops (resulting in certain environmental benefits) and could lead to a streamlining of deficiency, disaster, and crop insurance programs. To strengthen this option environmentally, federal crop insurance could be made available to underwrite farmers' financial risk of undertaking production practices which mitigate pollution or risk relative to typical practices. This option assumes that financially sound sustainable practices have been (or could readily be) defined on a crop specific basis.

Pros and Cons

Environmental

The option would help remove the existing disincentives to the rotating of crops with its associated benefits of the current commodity program.

Budget

Streamlines deficiency, disaster, and crop insurance programs. According to ERS, assurance would be more expensive to the Government than insurance. However, insurance raises the question of actuarial soundness and at what level it should be subsidized.

Implementation

It could streamline existing programs into an integrated program, yet pose no greater difficulty in implementation than current crop insurance programs. It would provide more flexibility for farmers and hence result in less resistance on their part.

Political feasibility

A number of growers' associations support a revenue assurance or insurance program. A major grower association representing Iowa, for example, has succeeded in coercing Congress to put pressure on FAPRI and hence CARD to conduct the economic-environmental analysis, ahead of Congressional debate, of the revenue assurance plan. There are a number of other well-thought out plans. Farmers, for example, might prefer that net returns be assured rather than revenue. The idea of setting of a pilot project in the Midwest has been suggested within USDA. A number of details, including the percentage of revenue that would be assured, has to be worked out before it is clear whether farmers

themselves would support the concept. Environmental groups have been neutral on the option and would not likely oppose it, though they are more likely to favor a stewardship payment option.

III. OPTIONS THAT DO NOT STAND ALONE

1. Cross Compliance for the Dairy Program

This option makes the benefits of participation in the dairy program conditional upon compliance with management measures for animal waste. Since dairy farmers do not directly receive the subsidy, the option does require some ingenuity in assuring that the benefits are passed onto the producers in a way that holds them accountable for the environmental requirements. One possible way would be to make fluid (Class A) allotments conditional upon certification that the cooperative producers are in compliance with the requirements. The assumption is that a Clean Water Act will be passed with CZARA type requirments for management measures in targeted watersheds.

Pros and Cons

Environmental benefits

Pros: The participants in the dairy program are not subject to environmental requirements as a condition for program financial support. The option would provide a powerful inducement to develop nutrient management plans. Cross compliance could serve to raise the cost of production in areas where land for proper disposal of land is scarce which in turn could damper the amount of production in those areas. On the other hand, areas where land is available are likely to increase production.

Cons: Not all dairy producers participate in the dairy program.

Budget

As compliance costs increase, there will be a call to increase the dairy subsidy from some areas of the dairy industry where dairy production is particularly concentrated. Nevertheless, the costs of compliance will likely be less in less congested areas. The result could well be a call for greater funding of the program unless Congress is willing to accept a falling out of the industry resulting in less overall production that would drive up consumer prices.

Political

Small and mid-size diary producers in certain areas of the country, such as the Southwest are likely to be hurt more and hence oppose more strongly cross-compliance. However, areas that have lately been losers in the dairy wars are likely to benefit and hence to support the program. On balance the industry would oppose it. A financial sweetener can overcome opposition.

Administrative

This option would require more administrative resources in developing and reviewing producer plans. However, this is presupposed in andy case with a CZARA-like Clean Water Act.

2) Export Enhancement Program Targeting (modification to the existing export enhancement program

In meeting our obligations under the GATT, the U.S. will have to reduce export subsidies over the implementation period. One option could be to target these reductions at most environmentally damaging crops. This option could also be stated as: continuation of export subsidies for crops that have been produced in an environmentally sound manner. An alternative formulation would be to condition the subsidies on certification that the producers of the commodity have made some progress towards implementation of reduced pesticide use/risk measures in the production of the commodity.

Pros and Cons

The proposed program would now have the combined effect of trade promotion and enhancement of environmental quality. Theoretically, a reduction in the subsidy would alter growers production decisions, since they would not have as lucrative a (if any) market for all of their crops. This could create an incentive to produce less environmentally damaging crops, or to enroll in a land retirement program. In meeting the above (dual) objective, we would also be moving towards meeting our GATT obligations in a manner that makes good environmental sense. This option also reduces budgetary outlays, and potentially wasteful practices that can result from subsidization.

Cons:

Political acceptability may be a problem, given that the program has been set up for trade promotion. To achieve GATT objectives, some people may want to continue the EEP for those commodities most in need of subsidization to compete in the world market -- without consideration for the environmental effects. Also, lack of subsidies will prompt production in other countries which could have a disproportionately negative effect on the environment (e.g. biodiversity and climate change).

3) Underwriting of Risk of Pesticide Use/Risk-Reduction Options

This option would involve underwriting farmers' financial risk of undertaking production practices, such as a) sustainable agriculture practices, b) crop/pest-specific use of area-wide IPM, c) crop/pest-specific use of safer pest management practices, which mitigate

pollution or risk relative to typical practices. The reduction in producer financial risk could occur through either guaranteed loan program for the purchase of necessary equipment or through a modification of the crop insurance program.

Pros and Cons

Environmental outcomes

Scale - Potentially applicable to many crops, geographic areas and farmers. Participation rate is unknown, but could be considerably higher than for current crop insurance which pays for losses due to natural causes and for which reliance on disaster payments is a substitute.

Magnitude - Variable, but could result in significant reductions in pesticide use/risk, chemical fertilizer use, and soil erosion for participants. Could greatly curtail the use of many pesticides which are often used to guard against relatively rare but potentially costly pest outbreaks.

Budget

Government - Potentially large cost, but cost commensurate with risk reduction benefit. Some cost should be offset by premium payments; offset would be dependent on dollar amount and number of participants. (Must take into account requirements of the budget agreement and deficit reduction).
Farmer - Cost offset by financial benefit if implemented properly.

Implementation

Enforceability - Crop insurance mechanism is currently operable but this would be a significant change. Medium to high difficulty in demonstrating that some safer practices were actually adopted and did not systematically increase risk.
Administrative ease - Difficult job in defining specifically what changes in what practices would qualify for coverage, as well as in developing formulas for quantifying applicable losses.

Political feasibility

Non-government - No strong opponents.
Government - Feasible unless perceived as ineffective.

4) "Green Loans" to Farmers to Purchase Technology That Achieves Pollution or Risk Reduction

Farmers need access to capital to purchase new, greener technology. Traditional sources of funding, such as banks, are averse to providing funds for technologies that are not standard farming practice because of the perceived added risk to the collateral (i.e., the

farmer's crop). This option would make more capital available for loans by direct government loans for the purchase of promising new, "greener," technologies or would underwrite the risk of loans made by private banks for such technologies

Pros and Cons

Environmental outcomes

scale: Potentially applicable to all geographic regions for all crops and for all farmers. Participation rate in the loan program is unknown but can be limited by putting financial eligibility restrictions in place for farmers and on technologies.

Magnitude: To the extent that promising technologies are implemented through purchases facilitated through the loan program, this program could achieve significant reductions in pesticide use/risk, chemical fertilizer use and soil erosion.

Budget

Government: For the first suboption, costs would depend upon how financially risky the technologies are for which loans would be underwritten. Costs for the second suboption are a function of the number of defaulted loans required to be guaranteed plus administrative costs. This could be resolved by limiting the range of eligible technologies to those which have proven track records.
Farmers: Cost of technology should be more than offset by enhanced financial return if implemented properly. Farmers should achieve cost reductions in terms of pesticide and fertilizer costs.

Enforceability:

Adequate loan documentation and contractual clauses are necessary.

Administrative ease

There would have to be a process for approving acceptable technologies.

Political Feasibility

Non-government: No strong opposition apparent.

Government: OMB must be convinced that the program would not pose a strain on the budget.

APPENDIX

ADDITIONAL OPTIONS THAT ARE LIKELY TO BE DISCUSSED IN THE FARM BILL DEBATE

1a) Baseline plus suboption: marketable set-aside (acreage reduction program) acreage for maximum environmental benefits --the Illinois plan.

To become eligible for deficiency payments for program crops, growers are required to reduce their planted acreage of a program crop by a federally specified proportion of the crop acreage base. By reducing domestic supplies, the ARP rate serves to stabilize domestic prices. The ARP rate for corn was 5% in 1992/93, 10% in 1993/4 and will be 0% in 1994/5. No deficiency payments are paid for the acres set aside, nor are program participants allowed to grow program or other crops on the land. It is required that the land be maintained, though not for environmental benefits.

The rental value of lands set aside range from half a billion to several billion dollars, depending on whether the set-aside is 5, 10, or 20 percent of crop acres and on the amount of program participation by farmers. Excusing farmers from small set-asides or part of large set-asides would provide well over half a billion dollars of incentives.

Farmers in the commodity program with environmentally sensitive land (soil erosion, habitat, floodplain, wetlands, etc.) would be allowed to sell or lease their production (base) acres to farmers in the commodity program with less sensitive land. Farmers would be issued production certificates, the acreage in production in a normal year, that could be sold. Thus farmer A (or farmers) with x acres of land to be set aside would be allowed to purchase x acres of non-setaside base acreage of farmer B with designated sensitive land. All or some of the deficiency payments tied to the purchased acres would accrue to farmer B, to whom the production certificates had been issued. Federal regulations could stipulate that all purchases of certificates for production on set-aside acreage on sensitive lands would have to be for a minimum number of years. The marketplace would determine the value of the production certificates.

Pros and Cons

Environmental outcomes

Pro: The proposal would allow multiyear removal of designated environmentally-sensitive lands, such as in floodplains or critical wildlife habitat, from production. Roughly 20 million base acres were idled in 1992. If even half of these 20 million base acres were on lands that were not environmentally sensitive (or relatively less), then some 10 million acres of highly productive lands could be exchanged for 10 million environmentally important land at no increased cost to the Government. By allowing some economic activity to occur on the setasides, the market price of the setasides could be lowered and hence lowering the risk

to purchasers that, in any one year, there could be no set-aside requirement and hence no benefit to the purchaser.

For example, roughly 1.8 million acres contained in the Missouri floodplain is used for row crop agriculture (most of which is devoted to program crops; some 700,000 acres in the upper Mississippi floodplain are used for agriculture. Exchange of set-aside acreage for production rights in the 2.5 million acres in the two floodplains could allow diminution of agricultural activities in the floodplains and thus reduce the need for levees and allow for wetlands and flood storage and other environmental benefits.

Con: The set-aside program is designed to control the annual supply of commodity goods to stabilize prices. For maximum environmental benefit, sensitive lands should be retired for prolonged periods of time. However, on occasion, the set-aside rate is zero, in which case, the sensitive land would be allowed to go back into production.

Budget

Pro: The option would be relatively inexpensive for the government. However, to the extent that marginal land is traded for more productive land, supply could increase, market prices would fall, and government deficiency payments would increase. This problem could be resolved by anticipating increased supply in establishing set-aside requirements. Otherwise, existing administrative resources could be focussed on facilitating the trades.

Con: If set-aside production rights are purchased for extended number of years, the purchaser, farmer A, would have purchased a right from farmer B which would, in such years, provide no financial benefit in years in which the set-aside rate is zero. Government budget expenditures for deficiency payments could increase. Increased acreage in production would lead to lower market prices. Thus, deficiency payments could actually increase substantially. The size of the set-aside requirements would have to be expanded, when necessary, as some farmers opt for an environmental plan instead of a set-aside.

Implementation

Pro: Readily enforceable and would not require more administrative resources than currently exist. ASCS has acknowledged that the program is doable.

Con: There would be transaction costs associated with the trading. Computer technology could bring these costs down. USDA experience in developing and taking CRP bids could help in overcoming the difficulty in setting up the markets.

Political

There appears to be strong Hill opinions for and against this option. Some Senate staff are sympathetic, some Hill staff who have voiced an opinion opposed.

2. Indexing Yields in the Price Support Payment Formula

This is option is included only for the purpose of informing upper management with regard to options that will be on the table. Since it does not entail environmental benefits nor lead to economic efficiency, it would not be an option that EPA would likely support.

Farmers have clamored to reestablish program payment yields used in calculating price support payments to major commodity farmers because yields have increased since the early eighties' five year period, currently used in payment formulas. However, because payments are now based upon the lower formula yield, there is no longer the incentive to improve yield such that higher highers would generate greater price support payments. This option would substitute an index of yield increases for a region instead to allowing each farmer to reestablish his payment yield--or continue the freeze.

Pros and Cons

Environmental Outcomes

There would not be any environmental benefit. Reestablishing base yield to a higher 1980's yield average would result in greater input use and hence environmental problems associated with commodity production. Farmers currently apply inputs on the basis of the lower market price, not the target price. Changing the base yield upward would likely increase the likelihood that farmers apply inputs at the higher target price and thus use more.

Budget

Budget outlays would likely increase if reestablished base yields are higher than historical base because difficiency payments would
have to be paid on more bushels.

Farmer Cost.

Research suggests that farmers would benefit from this option if only the yields were to change. However, OMB would likely change the formula so as to keep the towards cost of the program the same. The result could be a redistribution of subsidies which could make some producers very unhappy.

Administrative Feasibility.

Clearly, updating yields using payment formulas is much simpler than allowing farmers to reestablish yields on every farm. Nevertheless, establishing new payment formulas by region is still more administratively burdensome than the current system of frozen yields.

Political Feasibility.

Any attempt to increase base acreage so as to increase the total cost of the program would be heavily fought by OMB, let alone the environmental community. Any redistribution of funding merely as a consequence of indexing would not be politically palatable in the farming community.

3. Stewardship payments for safer pest management practices financed by chemical pesticide fee

Farmers would receive direct annual payments to subsidize the cost of undertaking safer pest management practices and/or using safer pesticides. Use of pesticides with relatively high risk or environmental insult would be charged a user fee. Such a fee would serve to both internalize the cost of the resultant risk/pollution imposed on society, thereby discouraging "risky" use, but also could pay for the subsidies which are incentives for safer use. Safer practices, safer pesticides, and high risk/pollution pesticides would all have to be well defined, but an oversimplification could have the safest 1/3 of all pesticides being subsidized, along with safer practices, and the riskier 1/3 of pesticides would require a fee.

Pros and Cons

Environmental outcomes

Scale - Very broad because it affets many different risks, pollution endpoints, and routes of exposure.

Magnitude - Depends entirely on size of subsidy and fee, but could be large if the incentive is large enough.

Budget

Government - Low cost if funds from fees are enough to offset subsidies. If fee is based on a per pound basis it is important to note that 1/3 --1/3 split may not be equated to similar pounds used.

Farmer - Farmers retain the freedom of choice in pest management, but financial advantage moves toward safer pest controls. There would be some winners and some losers.

Implementation

Enforceability - Low to medium difficulty.

Administrative ease - Implementation would expected to be difficult. Drawing the lines between subsidized controls, taxed controls, and all others would be difficult and contentious.

Political feasibility

Non-government - Many farmers involved in production agriculture may be opposed; sustainable agricultural producers and environmentalists would favor.

Government - General opposition to fees is strong; some politicians may favor given target and effect of fee and the self-funding nature of the program. Because of the taxation aspect of this option, the Congressional finance committees would be involved along with the ag committees. However, the ag committees would be reluctant to share jurisdiction in part because involvement by the finance committees would likely lead to considerable delays.

DRAFT September 7, 1994

FARMING SYSTEMS POLICY OPTIONS

Farming systems are a complete, integrated set of agricultural (plant and animal) production practices that maintain or enhance farm profits, long-term productivity, and environmental quality and natural resources. Farming systems often require more intensive management, more efficient use of inputs, a better utilization of the natural environment and processes, and increased knowledge due to their site-specific nature.

The farming system options presented here pertain to agricultural lands that are kept in production. The options are based on the assumption that management measures are available that can provide environmental benefits--water, air, and soil quality, wildlife habitat, climate change objectives, food safety, worker safety, and human health--while producing food and fiber. Generally, these options are based on the Administration's position on the reauthorization of the Clean Water Act and the Safe Drinking Water Act, the President's Climate Change Action Plan, the Administration's Pesticide Use/Risk Reduction Initiative, the Administration's proposed Food Safety Legislation, and EPA's Pesticides and Ground Water Strategy.

The options are presented in four main categories: baseline, geographic targeting, land management, and implementation. The categories are mutually dependent. For example, land management decisions have to be made no matter what geographic targeting option is chosen. The options provide alternative policies within each category. A discussion of the pros and cons of the options follows each main category.

The financial mechanisms and incentives to implement these farming systems are not included in the options since they are comprehensively explored in the financial incentives policy options paper. A variety of implementation mechanisms could be used: cross-compliance, cost-share programs, stewardship payments. The choice of incentive could vary depending on a variety of factors such as the cost of the option, expected environmental benefits, and/or political philosophy.

Baseline

Revise and Expand Current Farm Bill Programs--Water Quality Incentives and Integrated Farm Management The baseline option would take conservation programs that were authorized in previous farm bills and modify them to provide greater environmental benefits. Two programs would be targeted for modification: Water Quality Incentives Program and Integrated Farm Management.

Water Quality Incentives Program (WQIP) WQIP provides cost-share incentives to farmers to adopt management practices in specific geographic areas. As implemented, WQIP is a part of the Agricultural Conservation Program (ACP), therefore, total payments for both the management practices of WQIP and the structural practices of ACP are limited to $3,500 annually . States submit grant applications for specific watersheds up to $300,000 each. The grants are awarded competitively. The 1995

WQIP appropriation is anticipated to total $15 million.

To strengthen the Program, a significant increase in funding could be tied to better environmental targeting using states and EPA as partners in the process. In addition WQIP could be separated from ACP so that the combined $3,500 cap no longer inhibits integrated environmental solutions on farms.

Integrated Farm Management The goal of the Integrated Farm Management (IFM) Program Option is to "assist producers in adopting integrated, multi-year, site-specific farm management plans by reducing farm program barriers to resource stewardship practices and systems; and to help producers improve and conserve soil and water on farms by converting land to resource conserving crops." The Soil Conservation Service describes the crop rotations, practices, and systems to be used on the farm. Producers must enroll for three to five years. 20% of crop acreage bases must be in resource conserving crops (legumes, grasses, small grains).

Few producers have enrolled in IFM primarily because of the obscure nature of the incentives for the producer. To strengthen the program, the incentives for participation would be modified. For example, if producers were allowed to crop their set-aside acres with a commodity crop, participation in the program might increase dramatically. Other incentives could be considered such as expanding the uses of Conservation Reserve Program lands. No additional funding would be needed if adequate program incentives were adopted.

Ease of Implementation

a. *Enforceability* Enforceability has not been an issue to date because of the small size of these programs. However, some type of enforcement mechanism would have to be developed if these programs became wide spread. It is difficult to determine if practices or systems are implemented.

b. *Political Feasibility* There would be little political opposition to the expansion of these programs on other than budgetary grounds. Environmental groups may strongly support the expansion of WQIP as the vehicle for adoption of management practices/measures.

c. *USDA/EPA Implementation* USDA would need to increase the staff involved in these programs, if they increased significantly.

d. *Support by Other Federal Agencies* OMB would probably oppose the expansion of WQIP for budgetary reasons.

e. *Regional Flexibility* These programs allow for site-specific tailoring.

f. *Importance of Option Design* Currently WQIP cost-shares specific practices. The redesign of WQIP should include cost-sharing of more comprehensive measures or systems. Without an adequate incentive, farmers will not participate.

Costs

g. *National Budgetary Implications* IFM redesign would not have any implications for the federal budget. WQIP would depend on the funding levels proposed.

h. *Costs to Producers* Since the programs are totally voluntary and provide commodity program incentives or cost-share, producers would only participate to the extent that they benefited.

Economic Benefits

i. *Cross-media Impacts* Both programs can address a wide range of environmental concerns.

j. *Measuring Results* Environmental results would be difficult to measure.

l. *Compatibility with Other Environmental Legislation* These programs can support the implementation of the Clean Water Act, the Coastal Zone Nonpoint Pollution Program, and the Safe Drinking Water Act.

Geographic Targeting Options

To more efficiently use limited funds, farming systems should be focused on specifically defined geographic areas. Environmentally, the preferred target may simply be all agricultural lands. However, because of administrative and budget constraints, the targeted areas will have to be more focused. The options vary in the amount and type of land where farming systems would be implemented.

The degree or scope of targeted area depends on the targeted environmental benefit, and each has its costs and limitations. For example, targeting areas for management measures where watershed or aquifers are threatened or impaired will have the maximum benefit for water quality and wildlife, but may not be as effective in protecting agricultural farmworkers or ensuring the safety of the food supply.

Option 1: Agriculture Programs From an administrative perspective, agricultural lands enrolled in USDA programs could be fairly easily targeted for implementation of farming systems. Several current USDA programs could be used as targeting

mechanisms--commodity programs, marketing orders, Conservation Reserve Program, and highly erodible lands. Any combination of these programs could be employed. About 68 percent of all agricultural land or 270 million acres would be covered by using these USDA programs as targeting mechanisms. Most of the rest of agricultural land or 130 million acres is used for pasture or hay production.

If commodity programs were used as a targeting mechanism, agriculture lands producing crops covered by a variety of price support programs would implement farming systems. These crops include feed grains (corn, grain sorghum, oats, rye, barley), wheat, cotton, rice, soybeans, minor oil seeds (sunflower, canola, rapeseed, safflower, flax seed, mustard seed), sugarcane and sugar beets, peanuts, dairy, and tobacco. Under this option, approximately 83 percent of base cropland acres would implement farming systems.

Marketing orders cover approximately 30 crops, primarily fruit, vegetable, and nut crops. A purpose of the marketing orders are to control supply and protect consumers by restricting the grade, size, quality, and maturity provisions of the relevant crops. Marketing orders apply to a small number of acres nationally, but apply to significant amounts of cropland in Arizona, California, Florida, and Texas.

Beginning in 1995, contracts for acres retired under the Conservation Reserve Program (CRP) will start to expire. Many of the acres covered by the expired contracts will be put back into the production of food and fiber. Since these acres are primarily highly erodible cropland, producers will have to comply with the Conservation Compliance Program to be eligible for any USDA payments. These acres could be targeted to implement more comprehensive farming systems. A total of 36 million acres of cropland could be brought back into production if the CRP is not renewed.

The Soil Conservation Service has classified approximately 148 million acres as "highly erodible land". 95% of these acres are covered by the Conservation Compliance Program. Targeting highly erodible acres would dramatically increase the coverage of farming systems above the acreage coming out of CRP.

Option 2: Environmental Programs Under this option, agricultural lands that negatively impact the environment would be targeted for implementation of farming systems. Targeting could be based on any combination of the programs listed below. Some environmental targeting tools are already in use--wellhead protection areas and sole source aquifers under the Safe Drinking Water Act; PM-10 and ozone non-attainment areas under the Clean Air Act. Other environmental targeting mechanisms have been proposed under the Administration's proposals for reauthorization of the Clean Water Act and the Safe Drinking Water Act--impaired and threatened watersheds, source water protection areas.

Safe Drinking Water Act (SDWA) Two programs currently exist under SDWA that could be used to target land management options--the Sole Source Aquifer Program and the Wellhead Protection Program. Under SDWA, EPA has the authority to designate aquifers which are the sole or principal source of drinking water for an area, a sole source aquifer. Once an aquifer has been designated, EPA reviews projects with federal financial assistance in order to prevent federal funding of projects which might contaminate the aquifer and create a significant hazard to human health. 64 aquifers have been designated sole source aquifers under this program and 9 additional aquifers are awaiting designation. EPA has approved Wellhead Protection Programs for 35 states/territories. Under this Program, states designate wellhead protection areas for each wellhead of a public drinking water supply system. Once the wellhead protection areas have been delineated, potential sources of ground water contamination are identified and management efforts are developed to prevent contamination and protect public health. In addition to programs which have been specifically authorized by the SDWA, EPA is working with states to develop Comprehensive State Ground Water Protection Plans (CGWPP). Where states identify specific areas of concern in their plans, CGWPPs could also be used as a targeting mechanism. EPA has not yet approved any plans, although several states have submitted plans for approval. About 20 states are developing plans.

The Clinton Administration proposal for reauthorization of the Safe Drinking Water Act includes a recommendation for the creation of source water protection areas for all public drinking water supplies. If source water protection areas are included in the reauthorization, they could be used as another mechanism to target land management options. The purpose of these areas is to prevent pollution of ground and surface water sources of public water supplies.

Clean Water Act The recommendations in President Clinton's Clean Water Initiative for reauthorization of the Clean Water Act include two major proposals that could be used to target agriculture management options--1) state inventory of watersheds with impaired and threatened waterbodies or other special waters; and 2) creation of state watershed programs.

The Initiative recommends that every five years states specifically identify waterbodies and their watersheds that are impaired or threatened by nonpoint sources (including agriculture); and other special waters such as outstanding national resource waters and drinking water supplies. This inventory would also include the major stresses on the waterbodies, in addition to chemical pollutants.

The Initiative also includes a recommendation for the development of state watershed programs. The watershed programs would go beyond achievement of water quality standards to include broader environmental objectives such as wildlife habitat.

This provision, if adopted, would provide a mechanism for states to target environmental concerns comprehensively.

Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) Under CZARA, the National Oceanographic and Atmospheric Administration (NOAA), in cooperation with the coastal states, is determining boundaries for the coastal zone nonpoint source program. The geographic scope of the program must encompass land and water having a significant individual or cumulative impact on the state's coastal waters. The boundary determination will be made prior to the state submission of the CZARA program to EPA and NOAA in mid 1995. Currently two states, Delaware and Florida are entirely within the coastal zone.

Clean Air Act Agricultural lands would be targeted that are contributing to the degradation of air quality in (1) PM-10 non-attainment areas, and (2) ozone non-attainment areas.

The national Ambient Air Quality Standards were established to protect human health and well-being of the public against high concentrations of PM-10 (small particles that can be inhaled) and other criteria pollutants (ozone, nitrous oxide, lead, carbon monoxide, and sulphur dioxide). Currently air quality considerations are not included in the decision-making process for selecting soil conservation measures and other farming practices such as field burning.

Environmental Stewardship Zones Environmental Stewardship Zones (ESZ) are a new idea that is being developed by EPA's Office of Pesticide Programs in response to the Administration's Pesticide Use/Risk Reduction Initiative. ESZs would be designated by each state and would consist of acres in environmentally-sensitive areas and/or acres providing major inputs to the human diet. A total number of acres would be available nationally and would be divided among the states in an equitable manner allowing for the extent of agricultural production and the extent of environmentally-sensitive areas to be considered. The number of acres put into the program nationally would be a function of the nature of the financial and market incentives and the cost of such incentives. A pilot program to test the concept may be necessary, at first. States would designate the location of ESZs, subject to EPA and USDA approval.

Ease of Implementation

a. *Enforceability* Geographic targeting options would not require enforcement, only regulations putting the chosen option in place. Incentives or sanctions would be administered in the targeted area only.

b. *Political Feasibility* Targeting based on environmental conditions can be

viewed two ways. It addresses the concern that private and/or public funds should be expended only where there is a demonstrated environmental need. On the other hand, many producers may view targeting as inherently inequitable since producers in impaired watershed might be required to apply additional management practices. Conversely, producers in targeted watersheds might receive additional funds to correct problems that producers in other watersheds corrected on their own.

c. *USDA/EPA Implementation* Any of the agriculture program options could be easily implemented by USDA since almost all the lands affected by the program options have already been identified.

The environmental program options vary in their ease of implementation. The nonpoint source management area under CZARA will have been identified by mid-1995. PM-10 non-attainment areas have already been identified. Although sole source aquifers and wellhead protection areas have been identified, they have not been entered into a comprehensive national data base that could be used for geographic targeting. States can supply ground water areas for geographic targeting. Currently, EPA does not have the ability to geographically target threatened or impaired watersheds. If the inventory provisions in the Administration's recommendations were enacted with reauthorization of CWA, the inventory would not be available until 1997, at the earliest. Source water protection areas await reauthorization of SDWA. No mechanism has bee established yet to identify Environmental Stewardship Zones. PM-10 and ozone non-attainment areas are included in a national data base called Aerometric Information Retrieval System.

d. *Support by Other Federal Agencies* USDA would probably not support targeting based on potential SDWA or CWA reauthorization language, since the timetable and the targeting mechanisms themselves are uncertain. However, all relevant federal agencies signed off on the Administration's recommendations for reauthorization. USDA's support for other environmental targeting mechanisms would depend on the degree of certainty in the designation. The Office of Management and Budget (OMB) would support the option that gives the largest environmental return for the least cost. The analysis comparing the options will not be available for several months, however, USDA programs, especially commodity programs and marketing orders, would not be able to target environmentally-sensitive land very efficiently.

e. *Regional Flexibility* Targeting through agriculture programs would not allow for regional flexibility since they are based on national program participation. Environmental programs would be targeted to regional and/or state environmental concerns. Targeting through CZARA would provide the least flexibility of any of the environmental programs. As an option tends to become more flexible, it tends to become more difficult to administer.

f. *Importance of Option Design* Agriculture programs have already been designed, but will be modified in the 1995 farm bill. State options such as watershed programs or environmental stewardship zones would be targeted using a broad base of public input. If targeting were focused on the commodity programs, land used for minor crops would be ignored; some food safety or farmworker safety concerns might be overlooked. The marketing orders system could provide an avenue to address environmental objectives for minor use farmers.

Costs

g. *National Budgetary Implications*

h. *Costs to Producers* The cost implications for the national budget or producers depend on the incentive mechanism used to implement the option. If some type of cost-share program is used, the greater the number of acres included in the option, the greater the national budget outlay. However, if a cross-compliance mechanism is used for agriculture programs, any targeting option would be budget neutral and the cost would be totally borne by the producers.

According to the cost/benefit analysis prepared for The President Clinton's Clean Water Initiative, targeting threatened and impaired watersheds with CZARA-like management measures would total an estimated $1 to $1.8 billion. Federal agencies would incur costs in the range of $118 to $210 million.

Initially the costs to the federal government would be higher since more data would be needed to determine which geographic areas should be targeted. Ultimately, the total costs to federal agencies would decrease over time, due to reduced workload and reduced cost-share and technical assistance.

Economic Benefits

i. *Cross-media Impacts* Cross-media impacts are determined by the farming system selected, not the geographic targeting option.

j. *Measuring Results* EPA estimated that 156,200 impaired or threatened river miles and 7.1 million impaired or threatened lake acres would show measurable water quality improvement (10% high likelihood and 46-58% medium likelihood). Impact on estuaries was not estimated due to lack of state information.

k. *Synergy between Options and Addressing Multiple Objectives* Although the agriculture programs do not specifically address wildlife, some CRP lands with expiring contracts could support important habitat areas. There is some overlap between highly erodible lands and water and air quality concerns.

l. *Compatibility with Other Environmental Legislation* Targeting based on threatened and impaired watersheds, state watershed programs, and source water protection areas would reflect the Administration position on the Clean Water Act and the Safe Drinking Water Act.

Land Management Options

Geographic targeting is simply the first phase of farming system options. Within the targeted land area, decisions must be made as to the management practices, measures, or systems that will be implemented. The major choice is whether management is based on whole farm planning (comprehensive management) or selective implementation of specific management practices. Options one and two basically employ the whole farm planning concept. Options three through six employ selective practices or measures.

Option 1: All Agriculture Management Measures Implement all agriculture management measures developed for the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) guidance.

The CZARA guidance includes six agriculture management measures: erosion and sediment control, small and large facility wastewater and runoff from confined animal facility management, nutrient management, pesticide management, grazing management, and irrigation water management. Under this option, the incentive mechanism would require that all applicable management measures be implemented on a farm. The comprehensive nature of this option would equate to whole farm planning systems.

Producers would be able to adopt best management practices on a site-specific basis, as long as the management measure was met. The management measures would not require specific best management practices, since the choice of practices depends on the conditions on the farm. Management measures allow for myriad variations of practices to implement the measure. For example, the irrigation management measure requires that the timing and amount of irrigation water match crop needs. This measure can be achieved through the implementation of a variety of specific management practices such as irrigation scheduling, flow measurement and control, and trickle irrigation. More intensive management is required to precisely determine crop needs on a site-specific basis.

Option 2: Revised Agriculture Management Measures Implement all agriculture management measures in Option 1 with the following changes: strengthen pest management measure and add measures for air quality and wildlife habitat.

The CZARA management measures were developed to restore and protect coastal waters from nonpoint source pollution. Since CZARA management measures focus on water quality, other important environmental goals might remain unaddressed, such as food safety and worker protection, air quality, or wildlife habitat. This option would strengthen the systems approach to whole farm planning.

A wildlife management measure could enhance and restore habitats for endangered, threatened, and candidate (ETC) species. This measure could be applied to all ETC wildlife or targeted to terrestrial, riparian, or other areas. Incentives could be provided to farmers who implement cropping practices to promote on-field habitats and restoration projects. This option would have a positive impact for those species whose habitat intersects agricultural lands and whose survival often competes with agricultural production such as the sharp-tailed grouse in Idaho or the Delta smelt in California.

An air quality management measure would address violations of the PM-10 and ozone air quality standards by practices such as wind erosion, crop burning, crop dusting, and other agriculture activities. Under the Clean Air Act, as amended in 1990, states are required to submit plans to EPA for reducing emissions of particulate matter from sources contributing to the problem. The measure would also address agriculture activities that contribute to precursors of PM-10 such as ammonia from animal feedlots and precursors of ozone such as from nitrous oxide from prescribed burnings.

A strengthened pesticide management measure would address some of the weaknesses inherent in the CZARA guidance. The new measure would implement whole farm management systems, using all available technologies, to reduce the need for pesticides and, when necessary, substitute less risky pesticides (e.g., biological) for higher risk pesticides.

Option 3: Selected Management Measures Under this option, management measures would be implemented only for the agricultural sources which contribute to an environmental problem. For example, if a particular species (or human community) were threatened by pesticide use, the pesticide management measure would be implemented in that area. If a particular waterbody were impaired by phosphorus, all management measures, except pesticides, would be implemented in that watershed since phosphorus is a nutrient (animal and/or chemical based) which attaches to soil. The possible management measures would include the full range from Option 2: nutrient, sediment control, animal facility wastewater runoff, grazing, irrigation, air quality, pesticide, and wildlife management.

Option 4: Nutrient Management Measure Implement only the nutrient management measure, since it may be the most cost-effective measure. EPA analysis completed for the President Clinton's Clean Water Initiative determined that producers could save at

least $700 million annually from implementing this measure. The goal of a nutrient management measure is to minimize and/or prevent nutrients from running off into surface water or leaching into ground water. The measure requires the development and implementation of a nutrient management plan with specific components such as nutrient budgeting, realistic yield goals, and soil/tissue/manure testing. The specific practices depend on the site-specific conditions described in the plan.

Option 5: Pesticide and Pest Control Management Farmers would work closely with SCS, or certified crop consultants, to develop pest management plans. A minimum set of practices would be required. This option targets pesticide use reduction and the adoption of various integrated pest management strategies. The CZARA pesticide management measures would be the baseline which would be expanded or adjusted to address regional variations.

Practices to implement the measure would include: evaluating past pest control and cropping measures; examining the soil and physical characteristics of the site; use of IPM strategies (crop rotation, pest monitoring, timing of planting, biological control, judicious use of pesticides based on economic thresholds, etc.); selection of least risky pesticide; use of pesticide resistant strategies; regularly calibrating pesticide application equipment; use of anti-backflow devices on mixing tank hoses; use of banded application techniques; and pesticide record keeping.

Option 6: Selected Best Management Practices Implement only selected practices within the management measures which may have the broadest application with important environmental benefits for a variety of media. Crop rotation and scouting are described below, but other practices such as contour farming, conservation tillage, filter strips, green manures, resistant cultivars, biological controls, or nutrient soil testing could also be implemented.

Crop Rotation Crop rotation as a valuable pest management technique and directly applies to farmers of monocultures, particularly corn growers. For example, available usage data indicates that an acre of continuous corn is four times more likely to be treated with an at-plant insecticide than an acre of rotated corn (56% vs 14%). Growers who grow continuous corn do so because corn is more profitable than an alternative crop. Any program that would make rotations a more attractive option and would reduce insecticide use by 42 percent for each additional acre brought into rotation. Rotating with a leguminous crop adds the benefit of reducing the need for nitrogen inputs to the soil.

Scouting and Pest Monitoring About half of all treated field corn is treated with insecticides unnecessarily, since only 50 percent of treated field corn acreage contain pest populations above economic injury levels. Therefore, scouting and pest monitoring

techniques can have an economic and environmental benefit. Monitoring of weed infestation economic thresholds is also important because herbicide use makes up the majority of pesticides applied to agricultural lands.

Required practices could also be developed through a state plan in conjunction with Environmental Stewardship Zones. They would be subject to USDA and EPA approval with plans being centered around commodity-specific strategies.

Ease of Implementation

a. *Enforceability* Installation of structural components of management measures, i.e. animal waste storage or anti-backflow devices, can be readily ascertained as can the creation of nutrient management plans or conservation plans. Assuring the implementation of the management practices in the plans is more problematic. Pesticide or fertilizer purchases could require a "prescription" or implementation could be verified by SCS spot checks and/or certification of private consultants.

Enforcement has been a contentious issue in the agriculture community. To enforce any of these management options, USDA would have to withhold payment to farmers. Historically, USDA (SCS) has been reluctant to enforce against farmers who it perceives as its clients. The more management measures employed the greater degree of enforcement required.

b. *Political Feasibility* Management measures allow for myriad variations of practices to implement the measure depending on the specific conditions on the farm. However, some agriculture groups perceive the measures to be rigid, especially for animal waste. Even though whole farm planning is a concept being widely promoted by many agriculture groups, as the menu of measures becomes more comprehensive, more opposition will develop. Producers will favor voluntary programs over a cross-compliance approach (although participation rate will be considerably less for a voluntary program). Comprehensive farming systems will appeal to consumer and public health groups. Environmental groups have been generally supportive of the comprehensive management measures approach, although they would like to see measures based on performance, especially for soil erosion. Congressional Agriculture Committees are still very responsive to the farmer and commodity groups, however, the budget may be the overwhelming constraint.

c. *USDA/EPA Implementation* The options vary in their need for USDA education and technical assistance. The recent loss of 1,000 SCS staff may seriously impede USDA's ability to provide needed assistance. SCS is expected to lose another 500 positions. USDA does not have adequate trained field staff to write plans or even provide intensive technical assistance to all the farmers that would be affected by these

options, especially the more comprehensive options. SCS and Extension staff are not specifically assigned to environmentally sensitive areas: they are spread out to provide geographic coverage. Extensive training of USDA staff would be necessary. SCS expertise is in soil erosion, not the broad array of other management measures. Certified crop consultants can be used in lieu of SCS personnel. Currently not enough certified consultants available to meet the farmer demand for their services that would result from the implementation of these management options.

Even though EPA has a national data base to target PM-10 and ozone non-attainment areas, we currently have no documentation as to where agricultural practices are contributors to violations of these air quality standards. EPA and USDA are working together to estimate air emissions from wind erosion and evaluating practices to address the issue.

d. *Support by Other Federal Agencies* USDA level of support is dependent on the degree and scope of the imposed management measures, and whether they are mandatory (i.e., linked with existing commodity programs) or voluntary in nature. Although all relevant agencies--USDA, DOI, OMB, FDA, etc.--signed off on the President's Clean Water Act Initiative, Sustainable Agriculture and Pesticide Use Reduction Initiative, and proposed Food Safety Legislation, the level of support from each agency is unclear.

e. *Regional Flexibility* By their design, management measures must be adapted to site-specific conditions. They do not prescribe specific practices that must be adopted on every farm. If specific management practices are implemented, producers may view this option as limiting their flexibility.

f. *Importance of Option Design* The basic management measures have already been written through CZARA. If there are any changes to the existing management measures, there may be opposition from a variety of agriculture groups who felt they had not been consulted in the CZARA process.

Costs

g. *National Budgetary Implications* (See geographic targeting g. and h.)

h. *Costs to Producers* Since selected management measures will be less inclusive, the costs to farmers would be less than having to implement whole farm planning. If management measures were targeted to threatened and impaired watersheds, 33 to 50 percent of the producers would have to implement the measures.

Economic Benefits

i. *Cross-media Impacts* The Climate Change Action Plan estimates that implementation of nutrient and pesticide management would result in a reduction of 2.7 million metric tons of CO_2. In addition, the Plan estimates a reduction of N_20 emissions by an additional 4.5 million metric tons of carbon equivalents. If the comprehensive set of management measures are implemented (Options 1 and 2) multiple benefits to soil, water, and air quality, wildlife, food safety, farmworker safety, and human health would be attained to varying degrees. As management measures/practices are targeted to selected environmental problems, the multiplicity of benefits will decrease.

j. *Measuring Results* If Option 1 were implemented in threatened and impaired watersheds, EPA estimated that 156,200 impaired or threatened river miles and 7.1 million impaired or threatened lake acres would show measurable water quality improvements (10% high likelihood and 46-58% medium likelihood). Impact on estuaries was not estimated due to lack of state information. No estimates have been made on the impact on other environmental indicators. EPA's Office of Pesticide Programs is developing methods to measure reductions in pesticide use as part of its Pesticide Use Reduction Strategy.

k. *Synergy between Options and Addressing Multiple Objectives* Most of the management measures/practices are not mutually exclusive. Any type of farm management planning system will result in improvement to land, water, air, wildlife, and human health. For example, although Option 1 is targeted at water quality, it will produce other environmental benefits such as soil and air quality, food safety and human health, and wildlife and habitat preservation. It addresses mitigation of existing pollution, as well as pollution prevention objectives. Pollution prevention opportunities diminish if measures/practices are tightly focused on current, demonstrated problem areas.

l. *Compatibility with Other Environmental Legislation* Option 1 would use farm bill incentives to implement the agriculture portions of the Administration's proposals for reauthorization of the Clean Water Act and the Safe Drinking Water Act. In addition, the nutrient and pesticide management measures would implement a portion of the President's Climate Change Action Plan.

Many of the management measures would complement the current FIFRA/FFDCA Food Safety legislation and could have an impact on regulations stemming from it. For example, the farm bill program could pay farmers to install filter strips. This incentive would make it easier for EPA to limit pesticide use by prohibiting a pesticide's use on crops without filter strips and thereby make it easier for farmers to reduce their pesticide use. A range of regulatory controls can be applied to other practices as well. The implementation of specific pesticide use reduction measures, particularly where those measures are targeted to priority ground water areas, may

qualify as, or at least complement, measures implemented under Pesticide State Management Plans.

Implementation Options

A variety of implementation mechanisms could be used, such as environmental compliance, cost-share programs, stewardship loans, crop insurance, stewardship payments, educational and technology transfer programs, and regulation. The choice of incentive (or disincentive) could vary depending on the cost of the option or the expected environmental benefit. The financial mechanisms are discussed in greater detail in the financial options policy paper.

Non-financial mechanisms may be need as well to implement farming systems in targeted areas. USDA data and resources may be inadequate to implement some of the geographic targeting and land management options.

Option 1: Mandatory Recordkeeping and Public Reporting Currently EPA and USDA do not have adequate data to know what pesticides are being used and at what rates. Mandatory record keeping and reporting would provide valuable information on agrichemical usage patterns.

A. Mandatory Recordkeeping and Reporting by the Farmer Require all farmers to keep records on all agrichemical usage (pesticides and fertilizers, or pesticides alone). Restricted use pesticides represent only a small fraction of the total number of pesticides on the market. California and Texas are the only two states which have mandatory pesticide recordkeeping legislation for use of all agricultural pesticides.

Incentive programs would not work since all agrichemical users must participate for the option to be effective and usable. Very few producers would participate if the program were voluntary. The regulation would restrict public reporting of the data by the state and federal government to the release composite figures only. This option is similar to the Toxics Release Inventory (TRI) program.

B. Mandatory Recordkeeping by Agrichemical Dealers and Distributors If farmer recordkeeping and reporting is politically infeasible, mandatory record keeping and reporting of pesticide sales at the dealer level might be more acceptable. Records would be kept at the point of sale by dealers who would record the amount of product sold and ask the purchaser about his intended use for the product. Reports would be filed annually with EPA aggregating sales information. Alternatively, manufacturers could be required to include a postcard with each unit of product that includes a barcode to indicate the identify the product and the appropriate unit. These postcards would be forwarded to EPA where they would be scanned into a computer database. Funding

would be necessary under either option to develop and maintain a data collection system.

Option 2: Expand USDA/National Agriculture Statistics Service Surveys As an alternative to mandatory recordkeeping, the current USDA/NASS surveys would be expanded. The scope of the surveys would be expanded in the areas of crops covered, states covered, information requested, sample size increase, etc.. Additional funding would be required.

Ease of Implementation

a. *Enforceability* The enforcement mechanism would remain the same as the mechanism for the restricted use pesticides. However, FIFRA has no enforcement mechanism for fertilizers.

b. *Political Feasibility* Mandatory pesticide recordkeeping of all agricultural pesticides was the subject of debate in the 1990 farm bill. Consumer, environmental, farmworker, and public health groups supported the provision with strong opposition coming from farmer organizations, commodity groups, and USDA. The resulting compromise required recordkeeping only for restricted use pesticides. EPA classifies pesticides for restricted use if they are especially hazardous. Restricted use pesticides are only available to certified pesticide applicators. The debate might be different in 1995 since vegetable and fruit grower association will support a recordkeeping provision. They feel that recordkeeping gives them some protection from liability and could help them in getting loans. The Wheat Growers and the Soybean Association will fight the provision.

If chemical fertilizers were added to the recordkeeping provisions, The Fertilizer Institute would vigorously fight the provision arguing that chemical fertilizers are not the only source of agricultural nutrients and should not be unfairly singled out. In addition, farm groups could be expected to argue that nutrients are not like pesticides because they are found in nature.

c. *USDA/EPA Implementation* For Option 1, both USDA and EPA will be inundated with nutrient and pesticide usage data. Administrative ability to process the data will depend on available resources.

d. *Support by Other Federal Agencies* USDA did not support a mandatory pesticide recordkeeping and reporting provision in the 1990 Farm Bill. However, USDA signed off on recordkeeping provisions for pending FIFRA/FFDCA Food Safety legislation. USDA would probably not support any recordkeeping requirements for fertilizers.

e. *Regional Flexibility* These options would not be flexible regionally, however, they would allow for tailoring of future programs.

f. *Importance of Option Design* The design of Option 1 is critical because of the political sensitivity of the issue. Confidentiality of individual usage data and access to the data are key concerns.

Costs

g. *National Budgetary Implications* The federal government would also incur some costs to process recordkeeping data under Option 1 and to expand the NASS surveys under Option 2.

h. *Costs to Producers* Farmer cost to comply with Option 1 would be minimal.

Economic Benefits

i. *Cross-media Impacts* If recordkeeping resulted in reductions in pesticide and fertilizer use, the entire range of environmental benefits would be impacted.

j. *Measuring Results* The environmental results of recordkeeping would be very difficult, if not impossible to measure. If the program functioned like TRI, local groups could use the information base to advocate reductions in agrichemical use.

k. *Synergy between Options and Addressing Multiple Objectives* These options could address the full range of environmental objectives.

l. *Compatibility with Other Environmental Legislation* Option 1 reflects the recordkeeping provision in the pending FIFRA/FFDCA Food Safety legislation.

Option 3: Certification of Farm Plans/Planners If farm plans of any type are required or cost-shared, some type of certification of the plans would be necessary to ensure their development and implementation. USDA, primarily SCS, does not have adequate staff to develop plans for all producers who would be affected.

A. Producer Certification With technical assistance provided by SCS, the Extension Service, or private consultants, producers would develop the required plans and certify their completion and implementation to USDA.

B. SCS Development and Certification SCS field staff would work with producers to develop the site-specific plans. SCS developed all the conservation plans under the Conservation Compliance Program.

C. Certified Consultants Plans would be developed by certified agriculture advisors. Private consultants and public employees (SCS, Extension) would be certified through the American Society of Agronomy's (ASA) Certified Crop Advisor Program or through a newly developed federal certification program. In either case, SCS would certify the plans produced by the certified advisors.

ASA's Certified Crop Advisor Program has been operating for four years and has been adopted in 34 states. Over 7,500 exams have been given. Approximately 2,000 people are currently certified; many more have passed the exam and certification is pending. To remain certified, advisors must fulfill continuing education requirements. This program does not contain any check on the plans written or the advice given. USDA and EPA have been working with ASA to strengthen the program.

Ease of Implementation

a. *Enforceability* For any of the options, SCS would probably be the agency responsible for enforcement, similar to its responsibilities under the Conservation Compliance Program.

b. *Political Feasibility* Producer certification would probably be the least politically costly option, however, producers would prefer that someone else (SCS, private consultant) develop the plans at no cost to themselves. Environmental groups do not appear ready to accept certification by the producer or private consultants.

c. *USDA/EPA Implementation* SCS does not have adequate field staff either in total numbers or training to develop whole farm plans for large numbers of farmers. However, since SCS is spread out and not targeted to environmentally important areas, some reorganization might be necessary, but very difficult to accomplish. It would be very difficult for USDA and EPA to develop a separate certification program for consultants.

d. *Support by Other Federal Agencies* SCS will probably resist adding this responsibility to its current work load, especially enforcing the development and implementation of the plans. It might be more amenable to certification of plans developed by other parties.

e. *Regional Flexibility* Certification of the plans would allow site-specific tailoring.

f. *Importance of Option Design* The certification of management measure/practice implementation is critical. Plan development without implementation is meaningless.

Costs

g. *National Budgetary Implications* Implications for the federal budget depend on the option chosen. Since SCS will have completed the development of Conservation Compliance Plans before the passage of the 1995 farm bill, it might be able to use its current resources to develop other plans.

h. *Costs to Producers* The cost to producers depends on the implementation mechanism.

Economic Benefits

i. *Cross-media Impacts* If a certification program increases the development and adoption of plans, the environmental benefits would be wide-ranging.

j. *Measuring Results* This option could easily be used to measure the number of plans written and certified or crop advisors certified. Measuring environmental results would be difficult.

k. *Synergy between Options and Addressing Multiple Objectives* Since certification is an implementation mechanism for adoption of farming systems, it has the ability to address many objectives. In addition, certification of private consultants may increase the professionalism of this sector and have a small increase in employment in rural areas.

l. *Compatibility with Other Environmental Legislation* No specific proposals for certification were made in Administration positions on the Clean Water Act or the Safe Drinking Water Act.

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LAND RETIREMENT POLICY OPTIONS

Land retirement programs in the 1995 Farm Bill provide an opportunity to advance Federal objectives regarding the budget, trade, rural development, human health, and environmental quality. The Conservation Reserve Program (CRP), the predominant land retirement program in 1985 and 1990 farm legislation, did not initially focus on environmental goals. Lands were recruited that were marginal for agricultural production and were characterized by significant *in situ* soil erosion problems. Land selection criteria were changed in 1990 to recognize opportunities to improve water and quality, but other benefits -- wildlife habitat, supply control, flood abatement, and carbon sequestration -- were achieved with little direction on how to direct resources to lands that would maximize multiple benefits to the public.

Gaps and inconsistencies with CRP land selection criteria and with commodity and conservation provisions under the 1990 farm bill made it difficult, if not impossible, to achieve many critical environmental objectives. Provisions of the CRP disallow economic uses of the land, even those that are consistent with environmental objectives, and necessitated inordinately high rental rates to recruit lands into the program. Great expense has been incurred for lands that in some cases yield little or no environmental returns, particularly those lands entered into the CRP between 1986 and 1990, yet proposals exist to continue payments on the same lands simply to maintain the inefficient stream of environmental benefits.

In addition, other benefits of land retirement, such as supply control, wildlife habitat, flood abatement, and carbon sequestration are largely coincidental and resources have not been strategically directed to lands where the greatest benefits could be achieved cost effectively. Accomplishing comprehensive environmental protection requires a longer term perspective than that offered by the CRP.

This paper proposes alternative land retirement options to protect environmental quality. The proposed options vary by the longevity of the conservation easements on retired lands, the purposes for which lands will be retired, and the costs to the Federal government. Beyond environmental quality effects, there are other considerations for land retirement options: the political and administrative issues, the benefits and costs, and the incidence of benefits and costs associated with implementing and enforcing land retirement.

Discussion in this paper is premised on certain assumptions about land retirement. First, long-term retirement for environmental purposes should be used only for those lands that cannot be used for agricultural production and still protect natural resources and environmental quality. Second, resources should be directed to those lands where water and air quality protection, wildlife habitat, flood abatement, carbon sequestration, and other environmental benefits are highly likely to be realized with land retirement. Third, a smaller fraction of existing lands under the CRP are needed to provide greater off-farm environmental quality benefits than are currently realized under the CRP. These benefits can be achieved by directing resources to those lands: (a) that contribute disproportionately to environmental degradation, (b) for which continued use for crop production is incompatible with environmental and critical wildlife habitat protection, and (c) that will lead to

discernable improvement of environmental quality if idled. Fourth, those lands which require permanent protection and can only be adequately protected by retirement, such as riparian areas and ground water wellhead protection areas, should be retired under long-term or permanent easements where landowners are willing to sell conservation easements for land uses that are consistent with environmental quality objectives. Fifth, a watershed management approach should be used to integrate all land resource management practices that will be used to achieve socioeconomic and environmental objectives. Finally, rental rates and Federal costs for the land retirement options can be reduced substantially by allowing certain economic uses on retired lands that are consistent with the environmental objectives for those land resources.

Environmental Quality Criteria for Selecting Lands for Retirement

Regardless of the tenure and institutional framework under which land retirement is accomplished, there is a need for environmental criteria to assure that environmental objectives are addressed with lands that are retired. These criteria are summarized:

(1) Critical terrestrial habitat should be protected and restored for wildlife that are endangered, threatened, or candidate (ETC) species listed under the Endangered Species Act, and rare or declining or otherwise important native species.

(2) Riparian agricultural lands should be enrolled in long-term land retirement to protect water quality in watersheds with impaired or threatened waters, to reduce flood damages, and/or to protect and restore habitat for important wildlife species.

(3) Environmentally sensitive lands should be enrolled in land retirement programs when they are the most cost-effective means for protecting ground water and wetlands resources. Such lands may include:

--State identified ground water recharge protection areas.

--State identified wellhead protection areas.

--Areas where ground water discharging to surface waters provides critical support for important wildlife species or threatens the attainment of designated uses for surface waters.

--Wetlands that are adjacent to or upstream from impaired or threatened waters or that important wildlife species depend on for part of their life cycle and can be protected/restored.

Land retirement resources for water quality purposes should be narrowly focused in areas where water quality is impaired or threatened in watersheds or aquifers. Retirement of lands in areas with severe wind erosion problems can support air quality goals where land management practices cannot adequately reduce windblown soil. Agricultural practices can provide adequate protection of the environment on most agricultural lands, and generally should be considered as the appropriate means to address protection or restoration of

environmental and wildlife resources. An example where air quality can be better addressed with farming practices can be found in the West Coast states of California, Washington, and Oregon. Harvesting and post-harvest practices cause emissions of smoke and dust that can be arrested by a change in management practices.

Land Retirement Baseline: Extended Conservation Reserve and Wetlands Reserve

An extended Conservation Reserve Program (CRP) could be reduced from current enrollments because of budget concerns. Environmental objectives on newly recruited lands (those lands that are not renewed from the current CRP) would apply to an extended CRP. A five- to 15-year retirement program of 20 to 35 million acres would be proposed based on admitting only those new lands that meet environmental quality criteria for retirement. An extended Wetlands Reserve Program (WRP) would select up to one million acres of environmentally sensitive wetlands, consistent with current environmental quality criteria for selecting lands for retirement. A CRP that retires more land than long-term easements can provide substantial environmental benefits if environmental selection criteria are carefully applied to all lands that are enrolled in an extended CRP.

An extension of the CRP means continuing a short-term solution to long-term environmental problems. First, existing CRP lands are not those that can most efficiently or effectively meet environmental objectives through land retirement. Second, when contracts expire, either the environmental benefits are negated or the contracts must be renewed to maintain the environmental benefits. Continuation of the CRP is supported relative to long-term easements by some landowners, rural communities, and others because it would provide a stream of income without removing agricultural land permanently from production.

The WRP would continue to be available for landowners to retire lands under permanent easements, consistent with environmental protection and wetlands protection criteria under the existing WRP. A criticism of the WRP is that lands with the loweest bids are enrolled rather than high-priority wetlands that can provide the greatest benefits.

Ease of implementation

a. *Enforceability.* Existing institutions and resources can be used for continuation of the CRP/WRP. Limited problems exist to monitor compliance with conserving land uses. Regular monitoring by SCS or other designated field personnel is needed to assure that contracted lands are managed consistent with program requirements. An extended CRP-type program has comparable monitoring requirements to a long-term easement program.

b. *Political feasibility.* Some continuation of the CRP would be supported by many interest groups. Wildlife and hunting groups probably would be supportive of this option because of the acreage that can be protected. The Office of Management and Budget, U.S. Congress, and others who are concerned about Federal budget outlays may be less receptive to continuation of the CRP/WRP at comparable levels but would support any reductions that can be achieved by reducing the size of the existing CRP/WRP. Other opponents are some environmental groups who favor a smaller, focused program that provides permanent land

protection. The National Farmers Union and other producer groups support extension of a substantial CRP. Agribusiness may present some opposition to this land retirement option.

c. *Administrative ability to implement the options both at USDA and EPA.* Administrative capabilities exist at both the U.S. Department of Agriculture and EPA to implement this option under existing organizations and procedures established for the CRP.

d. *Likelihood of other Federal agencies supporting the option (OMB, DOI, USDA).* The Office of Management and Budget would give weaker support to an extension of the CRP/WRP in proportion to the amount of lands renewed and their associated costs relative to the proposed long-term easement program, based on the extended CRP/WRP's higher costs. The U.S. Fish and Wildlife Service and the Office of Management and Budget also could be expected to prefer long-term protection that does not require future expenditures to sustain the flow of environmental benefits from idled lands. The U.S. Department of Agriculture probably would support this option.

e. *Degree of regional flexibility (place-based, site-specific nature of option).* This option could direct resources to specific regions for social, political, or economic goals, in addition to accomplishing more limited environmental objectives relative to an environmentally focused easement program. More extensive resources and retired lands could accomplish substantial environmental benefits if CRP renewals include environmental selection criteria. Criteria will be set in the field for meeting environmental objectives, subject to approval by State or National headquarters offices of the Soil Conservation Service. The role of EPA would presumably be defined by the current CRP enrollment process, or revised to include reviews by Regional or Headquarters offices of EPA.

f. *Importance of the design of the option (i.e. who makes the place-based (targeting) decisions that need to be made).* There could be additional attention given to how much land retirement renewals are focused on areas that are designated by States (for example, Section 305(b) and 319 (CWA) reports) and others (for example, The Nature Conservancy database on biodiversity and ETC species; U.S. Fish and Wildlife Service) for environmental protection.

Costs

g. *National budgetary implications.* A ten-year continuation of selected CRP lands (20 to 35 million acres) would cost $1 to $2 billion per year. Additional costs for the WRP add up to $90 million per year to Federal budget costs, assuming roughly 100,000 acres per year are added to the program. Future renewals of the CRP would add future Federal government costs to continue support for conserving land uses, potentially making the program more expensive than long-term easements.

h. *Cost to producers.* Land idling programs impose a cost on producers for the loss of agricultural production on idled lands. However, because land retirement is voluntary and landowners are allowed to bid or otherwise set a price for which they will accept retirement of lands/conservation easements, they are made whole for the economic value of their agricultural losses. Therefore, net costs to producers are presumed to be zero or possibly

negative (if producers receive more than their full market value from land retirement program payments plus economic gains from the conserved land use) for land retirement and this is not an important consideration for individual producers.

Economic benefits

i. *Environmental impact to all media.* More land would be retired under an extended CRP/WRP, compared to a long-term easement program, and could provide more wildlife habitat and biodiversity because of the greater acreage, but the benefits per acre of retired land would be expected to be much less. Limited funds will be available for high-priority, environmentally sensitive lands because of substantial CRP renewals that are expected for existing CRP acreage. Erodible lands would continue to be withdrawn from production, potentially avoiding or substantially reducing soil and water pollution from some CRP lands that contribute disproportionately to soil erosion and surface runoff problems.

j. *Extent to which results can be measured.* A measure of land retirement programs is the number of acres protected with conserving uses, but this should not be taken as a benefit of such programs. Measurable results should include benefits such as demonstrated water quality improvement in impaired or threatened waterbodies that are affected by retired lands or increased numbers and diversity of animal and plant wildlife species.

k. *Synergy between options and addressing multiple objectives.* An extended CRP/WRP can be somewhat better directed than current CRP lands, using the proposed environmental criteria, to assure that new acreage is enrolled to address environmental objectives. For example, riparian lands can provide important migratory bird corridors, protect impaired terrestrial and aquatic species, and reduce polluted agricultural runoff. Wetlands and ground water protection areas also can be accepted in an extended CRP/WRP. However, limits on newly recruited lands will limit the CRP/WRP's effectiveness relative to long-term easements that use more rigorous environmental selection criteria.

l. *Synergy between addressing the option in the farm bill and/or other environmental legislation (i.e. CWA, SDWA, ESA).* Land retirement in an extended CRP/WRP can address concerns in the Federal Clean Water Act, Safe Drinking Water Act, and Endangered Species Act, though not as effectively as the other options.

Option 1: Long-term Easements

A focused, long-term (30 to 50 years) or permanent land retirement program under the farm bill could admit perhaps 10 million acres for conserving land use easements. Additional lands could be admitted to such a program over the long run if it were to include substantial wildlife habitat and other environmental objectives. Budget constraints and landowners' voluntary bids are expected to limit the acreage accepted for easements. Crop producers would maintain conserving land uses on environmentally sensitive lands that would be continued through contracts or deed restrictions. Easements would focus on those lands that are needed in conserving uses for purposes of protecting the environment.

Recommended uses of an easement program would focus on environmental objectives for wildlife, biodiversity, and water quality. A primary objective of wildlife habitat protection would focus on endangered, threatened, and candidate (ETC) species, and rare or declining species of concern that can be prevented from Endangered Species Act listing. Land retirement should focus on protecting ecosystems and maximizing biodiversity. Focus areas for easements would include riparian lands that can provide water quality protection and wildlife habitat and migration corridors (two to four million acres). Ground water wellhead protection areas (one to three million acres) and threatened wetlands protection (one to three million acres) would comprise another large fraction of lands that would be enrolled in easements. Total acreage that would qualify for water quality and wetlands protection therefore would total somewhere between four and ten million acres.

An easements program to protect wildlife habitat for ETC and declining species could support the goals of the Endangered Species Act, Migratory Bird Treaty Act, and international agreements with Canada and Mexico for the protection of wetlands for migratory birds. There is little evidence to indicate the acreage needed or its location to adequately protect ETC and other critical species, nor is there a clear indication of the level of farmers' interest in providing long-term easements on their lands for purposes of wildlife protection. Given the uncertainty about the acreage needed and its availability, a pilot program could admit one to four million acres of critical habitat for species protection (including lands that achieve multiple objectives). Ongoing research and analysis would be a central component of any long-term (greater than 10-year) easement program. Experience with a pilot program could provide the studies and experience for a "wildlife reserve program" of up to 10 million acres, perhaps in the year 2000 farm legislation.

Lands and land uses that provide multiple objectives would be given top priority for selection. Land retirement in the proposed easement program would focus only on the worst land for farming and/or the best land for environmental protection. By directing land retirement resources to critically sensitive lands, other farm programs (for example, for soil erosion control, nutrient and pest management, animal waste management) that more efficiently address environmental quality problems would have greater resources available if land retirement is reduced to the minimum necessary to achieve environmental objectives.

A focused easement program could accomplish many environmental objectives. Greater environmental gains can be achieved that provide public benefits with less land and at less cost than currently under the CRP. Also, the conserving land use is protected permanently and landowners are paid once for that conserving use, versus the continuing payments required under a CRP-type program extension.

To encourage participation and minimize the bids necessary to enroll lands, a long-term easement program should allow land uses that are consistent with environmental objectives. For example, haying and grazing may improve grassland habitat. Timber production may be allowed in riparian and ground water protection areas. Other practices should be considered to ensure that lands continue to have economic value. By assuring that landowners can continue to produce on easement lands, the Federal government only purchases an easement for the damaging uses of the land and not the full value of the land.

There are concerns about maintenance of vegetation on idled lands regardless of the easements' duration and the institutional framework used to establish them. Useful-life easements have been suggested in the past, in which a conservation easement would be granted by landowners for the life of the vegetation that is established on idled lands. Depending on the tree and grass species that are established and the level of maintenance, the life of the vegetation could range from 10 or 15 years up to hundreds of years. Long-term or permanent conservation easements may be difficult to enforce, and incentives may be necessary for landowners to continue maintenance of conservation practices and land uses after Federal payments discontinue or land ownership changes.

Ease of implementation

a. *Enforceability.* Easements can be readily implemented and pose limited problems for monitoring compliance with conserving land uses. There will be a need for regular monitoring by SCS or other designated field personnel that contracted lands are managed consistent with program requirements. Greater long-term monitoring costs will be required for an easement program versus a shorter term land retirement program (unless fixed-term leases are renewed).

b. *Political feasibility.* The Office of Management and Budget, U.S. Congress, and others concerned about Federal budget outlays may be allies for initiating a land retirement system that does not expose the Federal government to paying for the same benefits over and over. Other allies are some environmental groups who favor a focused land idling program that provides long-term (greater than 30 years) or permanent land protection. The U.S. Fish and Wildlife Service would support a program that provides long-term/permanent protection for wildlife, particularly ETC and other species of critical concern. Opposition from some wildlife groups is expected for a long-term easement program because of its limited acreage, relative to the CRP. Other opposition would be expected from hunting groups (for example, Ducks Unlimited, Pheasants Forever and Quail Unlimited) and others who benefit from CRP lands and retirement criteria. The National Farmers Union, which represents primarily small- to medium-sized farms in the central United States, has opposed easements because of concerns about sustainability of farming and farm communities. Local and county governments also may oppose long-term easements because of their likely effects on reducing area tax revenues, sales, and purchases. Other producer organizations and agribusiness also may oppose long-term easements because of potential reductions in farm chemical and equipment sales.

c. *Administrative ability to implement the options both at USDA and EPA.* (Same as the baseline).

d. *Likelihood of other Federal agencies supporting the option (OMB, DOI, USDA).* The Office of Management and Budget would likely support an easement program as the less expensive of the options that provides long-term land protection. The U.S. Department of the Interior, particularly the U.S. Fish and Wildlife Service, could be expected to support this option if substantial wildlife habitat acreage can be supported through the farm bill budget. Mild opposition from the U.S. Department of Agriculture could be expected for a

reduced land idling program, because of reduced landowner payments from the CRP but also because of increased commodity payments and greater uncertainty about supply control.

e. *Degree of regional flexibility (place-based, site-specific nature of option).* The more limited proposal for an easement program, by virtue of its limited acreage, argues for less regional flexibility in retiring lands so that only environmentally sensitive lands are taken out of agricultural production. There is a risk that this option would direct resources to specific areas to achieve environmental goals that may not address important social, political, or economic goals that policymakers may wish to address with land retirement resources. Land retirement funds may be directed, to the extent possible, to watersheds and ecosystems where CRP funds currently go. Criteria could be established in national guidance for meeting environmental objectives, or could be established in the field subject to approval by State or National headquarters offices of the Soil Conservation Service and EPA.

f. *Importance of the design of the option (i.e. who makes the place-based (targeting) decisions that need to be made).* Resources would be strategically focused on areas that are designated by States (for example, Section 305(b) and 319 (CWA) reports) and others (e.g. The Nature Conservancy database on biodiversity and ETC species; U.S. Fish and Wildlife Service) to retire lands that provide the greatest potential environmental benefits.

Costs

g. *National budgetary implications.* A highly focused, long-term easement program could be phased in at 600,000 to one million acres per year. Assuming the costs for long-term easements are comparable to the costs experienced so far for the Wetlands Reserve Program (WRP), which recently admitted about 75,000 acres at a cost of $66.7 million, a total cost of $535 million to $1 billion per year may be incurred over ten years. There is an issue regarding whether easements are made in annual payments versus upfront payments, with related effects on how rapidly land could be enrolled in long-term easements.

h. *Cost to producers.* (Same as the baseline).

Economic benefits

i. *Environmental impact to all media.* A focused, long-term easement program is expected to more efficiently meet objectives for protection of ETC species, water quality, and riparian areas. Therefore, environmental goals under existing Federal environmental legislation (for example, the Clean Water Act, Safe Drinking Water Act, and Coastal Zone Act Reauthorization Amendments of 1990) could be supported by focused land retirement under the farm bill. Reduced amounts of land relative to the CRP will reduce total wildlife habitat and potentially could reduce total biodiversity vis-a-vis existing CRP enrollments. A small, focused easement program also would increase the amount of erodible and otherwise environmentally sensitive lands that would return to crop production, potentially having adverse effects on the quality of some soil, water, and air resources because of additional soil erosion, runoff, and nutrient and pesticide use, compared to the existing CRP.

j. *Extent to which results can be measured.* (Same as the baseline).

k. *Synergy between options and addressing multiple objectives.* A focused easement program can be designed with environmental criteria that assure acreage is enrolled to address multiple environmental objectives. For example, riparian lands can provide important migratory bird corridors, protect impaired terrestrial and aquatic species, and reduce polluted agricultural runoff. Wetlands and ground water protection areas also can be accepted in a long-term easement program by prioritizing them according to ETC and other species of concern that are likely to benefit from their protection.

l. *Synergy between addressing the option in the farm bill and/or other environmental legislation (i.e. CWA, SDWA, ESA).* Land retirement in a focused easement program, which uses criteria for the protection of water quality and ETC species, can address concerns in the Federal Clean Water Act, Safe Drinking Water Act, Migratory Bird Treaty Act, Endangered Species Act, and international wetlands agreements.

Option 2: Conservation Reserve Renewals and Long-term Easements

The CRP can be renewed to provide for continued retirement of some lands already enrolled in the program while providing focused land retirement for environmental purposes, or a so-called "50-50" option. For each acre renewed for another ten years under existing CRP leases, there would be one acre (or some other amount of land) that meets one or more environmental selection criteria and would be established in a long-term or permanent easement for environmental purposes. The additional acreage could come from CRP lands or newly recruited lands, so long as 50 percent (or whatever fraction is established relative to CRP renewals) of the lands meet environmental criteria discussed earlier.

A CRP/easements option would provide landowners with an opportunity to continue receiving payments for enrollment of a substantial portion of existing CRP lands that may or may not be significant environmental protection areas. Additional lands probably would be required to meet environmental protection criteria for enrollment.

The WRP would continue to be available for landowners to retire lands under permanent easements, consistent with environmental protection and wetlands protection criteria under the existing WRP. A criticism of the WRP, similar to that leveled against the CRP, is that enrolled lands are the cheapest available (that is, voluntary bids are lowest on lands that are of less economic value). While not necessarily inconsistent with environmental needs, enrollments have largely been for bottomland hardwood wetlands in Arkansas, Mississippi, and other Mississippi Delta states rather than high-priority wetlands. For example, in states such as the northern Great Plains, wetlands can provide critical habitat for declining waterfowl, songbirds, and other species. Future signups in the WRP should maximize the environmental benefits (not the acres of land retired) for a given expenditure.

Ease of implementation

a. *Enforceability.* Existing institutions and resources can be used for continuation of the CRP/WRP. Limited problems exist to monitor compliance with conserving land uses. Regular monitoring by SCS or other designated field personnel is needed to assure that contracted lands are managed consistent with program requirements. Lands retired for

environmental purposes could have more or less long-term monitoring requirements than option 2, depending on the length of the environmental easements.

b. *Political feasibility.* Being a hybrid of long-term easements and the CRP, support for this option would be expected to lie between the previous option and an extended CRP and WRP. This compromise option may get some support from most interest groups.

c. *Administrative ability to implement the options both at USDA and EPA.* (Same as option 1).

d. *Likelihood of other Federal agencies supporting the option (OMB, DOI, USDA).* The Office of Management and Budget could oppose an extension of this option in direct relation to the amount of lands that are renewed and recruited, though would be more supportive of this formula than one that essentially provides for large-scale renewals without targeting lands for environmental benefits. The U.S. Department of Agriculture could support this option somewhat more than long-term easements. The U.S. Department of the Interior's Fish and Wildlife Service is expected to support this option's focus on supporting long-term easements for environmental purposes on at least half the enrolled lands.

e. *Degree of regional flexibility (place-based, site-specific nature of option).* This option could direct greater resources to specific regions for achieving social, political, or economic goals, and accomplish intermediate environmental gains compared to long-term environmental easements or an as-is reauthorization of the CRP/WRP. Half the CRP lands would include environmental selection criteria. Criteria could be established in national guidance for meeting environmental objectives, or could be established in the field subject to approval by State or National headquarters offices of the Soil Conservation Service and EPA.

f. *Importance of the design of the option (i.e. who makes the place-based (targeting) decisions that need to be made).* (Same as the baseline).

Costs

g. *National budgetary implications.* If the acres are comparable to the current CRP, a ten-year continuation of half the lands currently in the CRP (18 million acres) could be expected to cost about $1 billion a year, with matching easements on the same acreage (total of 10 to 18 million acres) would cost an average of approximately $1 to $2 billion per year. (Experience with the WRP suggests that total costs are somewhat greater, perhaps 25 to 50 percent, for permanent easements versus ten-year CRP renewals.) If environmental easements are for a period longer than ten years and payments are made up-front, as they are in the WRP, annual costs in some years could be higher but the expected average cost should remain relatively unchanged over a ten-year period. Additional costs for an extended WRP could add up to $90 million per year to Federal budget costs, assuming roughly 100,000 acres per year are added to the program.

h. *Cost to producers.* (Same as the baseline).

Economic benefits

i. *Environmental impact to all media.* The greater amounts of land that would be retired under this option could potentially provide greater benefits for ETC and other species of concern and protection of water and air quality and wetlands than under option 1, but presumably less protection than a comparably sized long-term easements program because environmental protection criteria are used on only half the land that is enrolled. The benefits per acre of retired land would be less than long-term easements.

j. *Extent to which results can be measured.* (Same as the baseline).

k. *Synergy between options and addressing multiple objectives.* Combined CRP renewals and long-term easements allow resources to be directed towards environmental purposes on at least half the lands that are enrolled in the proposed program. However it provides little capability to address multiple objectives on the other half of the land that is renewed in the CRP. For example, riparian lands can provide important migratory bird corridors, protect impaired terrestrial and aquatic species, and reduce polluted agricultural runoff. Wetlands and ground water protection areas also can be accepted in a long-term easement program by prioritizing them according to ETC and other species of concern that are likely to benefit from their protection.

l. *Synergy between addressing the option in the farm bill and/or other environmental legislation (i.e. CWA, SDWA, ESA).* Land retirement in this option allows concerns to be addressed on half the lands in ways that can support objectives in the Federal Clean Water Act, Safe Drinking Water Act, Endangered Species Act, Migratory Bird Treaty Act, and international wetlands agreements.

Conclusions

Land retirement for environmental purposes should be considered for those lands that cannot be used for agricultural production and still protect natural resources and environmental quality. The EPA recognizes the role that land idling plays for achieving income support, supply control, and other social and political goals. While considering other goals, land retirement resources should be directed to lands where environmental benefits are achieved cost effectively, with better cropping practices used elsewhere to protect the environment. Lands that require long-term protection and can only be adequately protected by retirement, such as riparian areas and ground water wellhead protection areas, should be idled under long-term or permanent easements where landowners are willing to sell conservation easements for land uses that are consistent with environmental quality objectives.

Long-term easements have the potential to retire adequate lands for long-range protection of environmental values. Some riparian zones, ground water recharge areas, and ETC species' habitats need permanent protection. Long-term or permanent easements on six to ten million acres of privately-owned agricultural land are viewed as crucial to successful protection of certain lands. Taxpayers will give greater support for protection of these areas if they only have to pay the rental value of the land once, rather than making annual

payments with the risk of those lands returning to crop production in ways that threaten the environmental values for which they are temporarily protected.

Shorter-term easements, such as in the 10-year CRP, provide more protection than cropping practices for certain resources, such as wildlife habitat, soil, air and water. The CRP also may meet many social and economic goals. If the CRP is extended, resources should be focused carefully to new lands that can provide environmental benefits for the general public as well as landowners, and to those lands that accomplish multiple objectives. For example, a CRP extension should focus resources on nonattainment areas for air and water quality and for wildlife species that are threatened by agriculture, particularly where farming practices cannot be modified in ways that can achieve environmental objectives.

To encourage participation and to minimize the Federal costs necessary to enroll lands, a long-term easement program should consider allowing land uses that are consistent with the environmental values to be achieved. For example, haying and grazing may benefit grassland habitat for wildlife by controlling weeds and by keeping short-grass habitats available (on lands managed for short-grass prairie species). Timber production may be consistent with riparian and other water quality protection goals. These and other practices should be considered for long-term easements so that lands continue to have economic value. By assuring that landowners can continue to produce economic goods on easement lands, the Federal government only purchases an easement for the damaging uses of the land and not for the full value of the land.

APPENDIX A: PRODUCTIVITY-BENEFITS INDEX

After the 1990 FACTA, bids for enrollment in CRP were evaluated in a three-step process. A productivity index, based on rental rates for the area adjusted by the average productivity for the parcel, was used to develop the maximum rental rate for the parcel. In step one, bids above the rental rate were rejected. For land bids meeting the acceptable rental rate, bids for "useful life easements" were automatically accepted. Useful life easements are small land parcels which have large off site impacts, such as filter strips or living snow fences. Finally, an environmental benefits index (EBI) was used to select more "cost-effective" CRP land. The EBI which is a measure of the conservation and environmental program goals that the land would meet if it was enrolled, is compared to the productivity index in order to select the best rental rates for the greatest environmental gains.

Land enrolled after 1990 reduced CRP costs and provided a targeted approach to environmental problems. However, the EBI doesn't incorporate all the objectives we have identified: enhancing water quality, soil quality, habitat, and human resources. It is currently based on seven equally weighted conservation and environmental factors: surface water quality improvement, potential ground water quality improvement, preservation of soil productivity, assistance to farmers most impacted by conservation compliance, encouragement of tree planting, enrollment in Hydrologic Unit Areas identified under the Water Quality Initiative, and enrollment in conservation priority areas established by Congress. Criticisms of the current CRP cite its overemphasis on water quality. The index should be modified to include wildlife habitat and human resources.

The framework for determining which land would be selected for program participation and fixing the "rental rate" could be developed by using a "Productivity-Benefits Index" (P-BI). The P-BI would incorporate both integration with other environmental goals and integration with other programs. A version of the EBI, modified to reflect additional national environmental objectives, should be included. Additionally, adjustments/additions to the P-BI by the regional, state, or local group, that would be developed and designated to oversee farming systems and environmental quality, would direct programs to reflect localized needs. For instance, flood plain management might be added in one area, while wildlife protection might be enhanced in another.

The productivity index should also be used to factor in the allowed alternative economic use(s), listed later in the paper after the discussion on land retirement options. Additionally, a factor to incorporate effects on other national programs, such as commodity programs, should be incorporated.

National goals and formula would determine state or regional distribution of the money. Caps for sub-regions may be necessary to mitigate local economic effects.

Last, programs should be redirected from short term contracts to long term or permanent easements in order to reduce costs and stabilize the flow of benefits. Alternative economic use options linked with easements make long term agreements more acceptable by providing a potential source of steady income to farmers.

APPENDIX B: ECONOMIC LAND USES ON RETIRED LANDS

One way to decrease the federal costs of land retirement, and to enhance its attractiveness to farmers, is to allow some alternative uses on lands that are enrolled in land retirement programs. We propose factors for these uses that can be included in the proposed P-BI to offset easement or rental payments. A list of alternative use options follows, as well as their criticisms and plausible solutions. Of course, the alternative land use must be in line with environmental objectives.

More restrictive limits on the use of some lands, which may otherwise be productive, may be needed to realize environmental objectives. Examples might include wildlife corridors, filter strips, or buffer zones for parks or critical habitat.

Haying and Grazing. Surveys found that farmers respond favorably to the idea of haying and grazing on idled cropland. A Soil and Water Conservation Society survey shows that producers are willing to reduce the rental rate received under the CRP by 11% in return for grazing and haying opportunities. However, under the emergency haying and grazing conditions in the early 1990's, CRP land holders accepted payment cuts of 25-50% in return for temporary haying and grazing rights.

Although generally acceptable to crop producers, the livestock groups have opposed allowing haying and grazing in concert with payments for two reasons. First, a heavy influx of haying and grazing enterprises will reduce beef prices. Second, due to the rental and cost

share opportunities which will most likely accompany any conservation program, the program participants who launch haying/grazing operations may have a cost advantage over established ranchers. Realistic compromises to reconcile these conflicting positions have yet to be devised.

Biomass Production. Perennial plantings, such as poplar trees and gamma grass, could be used as biomass sources for energy production. While generating income to producers, poplar trees and gamma grass used in energy production may aid in the fulfillment of another environmental goal -- clean air.

Criticisms of this option are two fold. The first stems from the limited ecological diversity which can be supported on land placed in monoculture production. Second, this experimental project will most likely be directed by only a small number of power plants; farmers producing this input could be faced with heavy transportation costs which lessen the appeal of this option. A proposed solution would therefore limit participation in this alternative to producers within a defined radius of the eligible power plant and on lands where monoculture production poses no threat to existing wildlife.

Lumber and Timber Production. Two types of commercial production are possible. Producers engaged in short term contracts or easements may elect to grow Christmas trees, where harvesting may begin only six to seven years after initial plantation. Harvesting for other types of commercial production may take longer, 20-30 years in the south and 40-60 years in the pacific northwest. But reforestation incentives for these slow-growing trees already existing within commercial tree farming tax structure allows for amortization of the costs of production over seven years as well as a 10% tax break each year for production expenses up to $10,000.

Four reservations exist for this alternative. First, it is subject to the same monoculture criticisms as above. Second, trees planted specifically for conservation purposes, such as shelterbelts and windbreaks are ineligible for the reforestation incentive. Third, even allowing for these tax incentives, economic returns to farmers may be too slow to sustain their operations, hence the need for cost sharing or easement payments. Fourth, once planted in trees, the flexibility to alter land use is eliminated. The tax structure could be modified, or cost share options could compensate for the deficiency, in order to make windbreak and shelterbelts production more appealing. Planting of multiple species would avoid monoculture problems and may smooth the schedule of economic returns.

Recreational Use. Preserved wetlands and grasslands also provide a wealth of opportunities where hiking, hunting, aesthetic, educational, and research benefits can be captured. The economic returns from these activities can extend to the whole community (such as hotels, restaurants, and equipment suppliers) as observed during the increased hunting activity on CRP lands in South Dakota. The delicate state of a recovering ecosystem leads some to question the appropriateness of recreational activity on program lands. Limited hunting permits could be distributed and paths could be created for other users to reduce disturbance of restored ecosystems.

Crop Rotations. Management plans which include rotation schedules allow for crop production, alternative uses, and environmental reserves to coexist on rural lands. The rotation schedule must be based on the average time needed to achieve environmental benefits (perhaps 4 years). This use lowers government payments because it allows some crop production at all times. Critics warn that this rotation is only environmentally beneficial under ideal weather conditions. Water shortages, which slow the establishment of cover could delay environmental benefits, such as nesting opportunities, result in rotations before new wildlife habitat was useful. A solution would be to require that rotations should be tailored to environmental conditions. Another challenging problem is that rotations must be integrated into whatever commodity support programs are maintained in the Farm Bill. If farmers lose commodity payments because of engaging in a rotation practice, they will be discouraged from pursuing the option.

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FARM BILL MARKETING OPTIONS

Farm programs include a number of marketing programs which could be modified to provide incentives for improved environmental performance by producers. An advantage of making such modifications is low budget exposure and an opportunity to involve consumers in supporting environmental programs. Five marketing options have been proposed for consideration: 1) requiring processors to pay a premium for milk certified as having been produced in an environmentally acceptable way (milk stewardship program), 2) labeling organic/low pesticide produce to provide greater consumer choice, 3) labeling products produced in other environmentally preferable ways, 4) making continuation of marketing orders contingent on the implementation of minimally acceptable integrated pest management or related practices, and 5) federal purchase preference for IPM produced foods. The pros and cons of each option are discussed and rankings of options are proposed.

Option 1: Milk Stewardship

The dairy price support program provides mechanisms which could include incentives for proper management of manures. Several options could be considered. One proposal focuses on offering farmers a premium (e.g., a 2 percent higher price) for milk certified as having been produced in an environmentally friendly way. This would be administered similarly to the Grade A milk price differential. Certification would be provided in a manner consistent with the current cross compliance provisions. The higher price would be implemented/enforced at the processor level, but through market mechanisms, it would largely be passed on to consumers. (The certified milk would not necessarily be labeled in the retail market). If the premium were a 2 percent price differential, it would result in up to half a billion dollars per year available to producers to fund, sequentially, 1) waste treatment systems and 2) land disposal practices.

Initially, the focus would be on supporting implementation of current CWA livestock regulations and CZARA management measures, but within a specified time period, proper enforcement of more advanced nutrient management measures during field application could be required. As in the management measures, requirements for smaller producers would differ from requirements for larger producers, due to differences in costs of treatment and in the magnitude of the pollution potential. All would receive the same price incentive to participate in the milk stewardship program.

In contrast to the Dairy Compliance Proposal, the green milk option is not an all or nothing scheme. Dairy farmers are not faced with the loss of program benefits (i.e., fluid milk quotas and support prices) if they do not comply with specified management practices. Instead, farmers are rewarded with a premium, over and above program benefits, for installing environmentally sound practices.

Environmental Outcomes Due to high costs per farm, dairy presents the greatest economic challenge for implementing proposed CWA management measures for agriculture. Its economic clout as an incentive to carry out management measures and its focus on a major environmental problem being addressed by the Agency ranks this option very high on our environmental outcomes criteria.

Budget Exposure. Because much of the cost could be passed on to consumers, there is likely to be little budget exposure.

Farmer Costs. Again, this option passes on much of waste treatment costs to consumers.

Administrative Feasibility. It is relatively easy to identify Clean Water Act manure management requirements and whether they are being met, and this option would greatly reduce the current tendency for farmers and processors to move to areas where regulation requirements are weak. Enforcing the land application through the CZARA nutrient management measure will face some ambiguities, but the nutrient management measure is among the strongest and most specific of the management measures. Milk marketing orders have the administrative capability.

Political Feasibility. This approach is probably more palatable than the Dairy compliance proposal, because it is "voluntary." However, there may be a perception that a premium is being offered to subsidized dairy producers at the expense of consumers -- this is complicated by the fact that dairy products are widely consumed by children.

Option 2: Labeling Options--Organic or Organic/Low Pesticide or IPM

The 1990 farm bill provides a basic certification program which could label fresh produce according to whether it was produced organically or with low pesticide techniques. The intent of the program clearly is to support 1) the soil, 2) the environment, and 3) consumer choice regarding pesticides. USDA staff working on this program is responsive to EPA interest in providing a choice regarding pesticides and food. The option under consideration is to grant a small team approval to pursue this option; the team would first determine what additional labeling would facilitate greater consumer choice regarding pesticides and then determine whether any additional farm bill
or committee language is needed to provide the desired additional consumer choice. Food safety may ultimately become a matter of choice as consumers weigh the tradeoffs between pesticide risks, product availability and cosmetic quality.

Environmental Outcomes. A well designed certification program would provide consumers with better information regarding consumer products (i.e., food safety considerations), production processes. It would also provide an incentive to producers to engage in environmentally sound practices. Greater choice promises to address our food safety needs most efficiently; since preferences vary significantly, we would never attain agreement from consumers on any one approach to growing fresh produce to meet various environmental, cosmetic, and safety needs. Choice was a major part of EPA food safety initiatives and was the focus of recent, joint pollution prevention strategies with USDA.

Budget Exposure. A more sophisticated organic labeling program or an interim IPM program would cost only slightly more than the current basic organic labelling program. Budget exposure would not be a significant issue.

Farmer Costs. Organic farmers or IPM farmers would probably benefit economically from a certification program that satisfied consumer interest in having choices regarding pesticides on their food, although some farmers would see modest cost increases, most should be able to capture offsetting market premia.

Administrative Feasibility. Inclusion and tracking of crop rotation in the organic certification program would require a significant commitment on the part of field staff, but could be feasible because of the focus on specialty crops intended for the organic market.

Political Feasibility. There are virtually no opponents to a well designed organic certification program and this could be achieved without using up our farm bill "chips." No change in legislation may be necessary, and USDA staff support EPA's interest in providing choice regarding pesticides and food.

Option 3: Labeling Options--Environmental Report Card

Out of a sense of environmental benevolence or concern, some consumers may voluntarily pay more for milk or other products labeled as produced in an environmentally friendly manner, while producers may achieve lower chemical input costs. Under this option, USDA (in consultation with EPA and industry) would provide direction for an industry run Report Card program. This option differs from the green milk option in that the product would be labeled at the retail level and participation by the processor would be purely voluntary. It differs from organic/low pesticide labeling in that the product consumers buy would not necessarily contain choice attributes regarding pesticides/food safety, which consumers prefer--the focus is instead on production practices that are less damaging to the environment.

Environmental Outcomes. Logically, the incentive to pay the higher price would be somewhat weaker compared to the organic/IPM options which support choices regarding pesticide, which are more directly in the consumers self interest. For dairy, it is clearly more effective to require the processor to pay more for environmentally certified milk than to offer it as an option for altruistic consumers. Therefore, based on environmental outcomes, environmental labeling ranks below the other labeling options.

Budget Exposure. Labeling options involve some administrative costs, similar to the organic certification program.

Farmer Costs. Farmer costs could be as high as any option which requires farmers to assume the full costs of dealing with environmental problems, such as livestock waste management. The intent is to have higher market prices for the labeled item cover part of those costs. This is less likely than when there is a mandatory premium or when the focus is on "food safety" labeling.

Administrative Costs. Administrative costs would be low, similar to the organic certification program and green milk options' administrative costs, except they would exceed costs of the green milk option, because the environmentally labeled product would have to be labeled in the retail stores (for processed and raw agricultural commodities unless otherwise focused).

Political Feasibility. This option might face resistance from other agencies, but would probably not offend producers. Processors may resist such a program, based on the extent to which increased costs can be passed on to consumers.

Option 4: Cross-Compliance for Marketing Orders Subject to the Agricultural Marketing Act

The option would stipulate that for a marketing order to continue to be granted to producers in a region they must agree to adopt IPM or other more environmentally sound system of agricultural production. Marketing orders would require that relevant (member) producers adhere to a set of minimally acceptable IPM practices in producing a specific percentage of the marketing order's output (e.g., 75 percent).

Most pesticides that represent a food safety threat are applied to fruits and vegetables. Fruit and vegetable production is rarely affected by the farm bill. The primary legislation affecting their production and the revenue of producers is the Agricultural Marketing Act. By linking environmental conditions to the granting of marketing orders in the Farm Bill, the environmental focus that has been reserved for the major

commodities might be extended to specialty crops. As of 1992, there were some 42 marketing orders covering such diverse crops as citrus fruit and spearmint. Since many of these are grown in California, Florida, and Texas, the Farm Bill could serve to further IPM in these production areas and crops that intensively use pesticides.

USDA issues marketing orders, which are legally binding. Orders set standards regarding various attributes of certain fresh processed fruits and vegetables, grains, meat, poultry , dairy products, cotton, and tobacco and assigns grades accordingly. Though voluntary, they serve the important role of vocabulary to the producer in whole sale and retail markets, and thus facilitate trade by enhancing communication and minimizing confusion. Marketing orders often grant some monopoly power: serving to reduce production or the supply of a commodity, or a commodity of a given set of attributes, and thus raise the price received by the producer. Marketing grades specified by marketing orders often require significant pesticide use.

Environmental Outcomes. The threat of removing marketing orders is a heavy hammer and threat of doing so would get the attention of producers. Many producers might be persuaded to use IPM and related practices which, in some cases, greatly reduce pesticide use.

Budget Exposure. There is relatively little budget exposure. Costs are purely administrative.

Farmer Cost. IPM has mixed cost implications, as some IPM projects produce chemical savings that far out-weigh the cost of increased management services, while others are not likely to cover their costs.

Administrative Feasibility. Many crops in many areas do not have specified IPM practices. Yet, this option wields a heavy hammer. Until the necessary practices are specified and agreed upon, this option cannot be effectively administered.

Once such requirements are established, self regulation appears feasible. EPA, USDA, and the industry would have to agree on the minimally acceptable system. There is, however, precedence for this: California's IPM pilot for example. The IPM Coalition, has also identified the key components of acceptable IPM programs.

Political Feasibility. Major opposition would come from the industry that currently benefits from the current structure. These industries represent a formidable political force, which generally are left out of farm bill debates. Help might come from producers already practicing IPM and from economists, who of course, rarely appreciate marketing orders and other such market distortions.

Option 5: Federal Purchase Preference for IPM produced foods.

The Secretary of Agriculture would review and implement ways in which USDA programs can be used to provide markets for foods produced with reduced risk pesticides and IPM techniques. Three areas of either direct control or influence in the Farm Bill are explored: The Food Stamp Program, the Women Infants and Children (WIC) Nutrition Program and the School Lunch Program. In addition, USDA in concert with EPA, shall coordinate with the General Services Administration and the Department of Defense to establish a phase-in plan to give federal purchasing preference to foods produced under approved IPM methods.

Environmental Outcomes The environmental outcomes would initially be limited. The activity would be symbolic and would in time create broader based markets for environmentally friendly products. The long term fate of this option will depend on public demand for and the market sector's response to reduced input products. Also, since the federal government is a significant consumer of products, it is reasonable to expect that the program could readily expand.

Budget Exposure Any budget exposure could be modest, although the government would have to pay a premium for products conforming to IPM techniques. The costs would be mostly administrative start-up costs for participating Federal agencies. If USDA choose to leverage the "buying power" of food stamps, for instance, there might be an added initial cost. In addition, this is not intended to be an entitlement program and therefore would have a clear sunset clause.

Farmer Costs There are no anticipated costs to farmers, as the program offers them a larger market for IPM based products.

Administrative Feasibility This is very feasible administratively. The reason for including it as a Farm Bill option is to get the issue on the table and out of the commodity program debate.

Political Feasibility The political feasibility is a function of the Administration's commitment to IPM and lowered exposure to pesticide residues. If the Administration chooses, it can be seen as taking significant pro-active steps to safeguard food supplies.

Appendix for 1995 Farm Bill Options for Research, Extension and Education

RESEARCH

1. Joint EPA-USDA prioritization of USDA ARS and CSRS research to focus on human health and environmental risk.

Background: Farmers and ranchers in the United States are increasingly concerned about production of food and fiber in a manner that does not make them liable for pollution associated with agricultural production. Consumers are increasingly concerned about both farming's relationship to environmental quality including water quality/quantity and pesticide residues.

Summary: This proposal recommends a process whereby specific applied research priorities are jointly agreed to and set to resolve production problems with an emphasis on air and water non-attainment areas. Three broad areas of concern are reductions of pesticide use, improved management of nutrients and air quality.

The types of applied research that will be encouraged include studies on nitrates including soil testing and advanced monitoring/ application systems, crop specific pest management measures focusing on Level III IPM, animal waste management systems, riparian areas and water quality and quantity including irrigation return flows.

Tools will have to be developed and studies undertaken to:

- Estimate emissions resulting from wind erosion events, crop burning, crop dusting, and other agricultural activities.
- Determine PM concentration during wind erosion events, and
- Assess the effectiveness of the alternative farming practices of farm management practices.

Two USDA agencies are responsible for the majority of research in the Department: CSRS and ARS. Because of the more applied nature of the CSRS research, we recommend that a process be joined with CSRS for joint development of research priorities along with a significant increase in funding for CSRS. EPA has experience in ecological systems management and understands the relationships between agricultural production systems and healthy ecosystems. Both fields of expertise would benefit a joint priority setting process. The following areas of expertise would be applied to the research setting process:

- Threatened and endangered species/candidate species and their habitats
- Nutrient/soil testing
- Migratory birds and their habitats
- Farm worker protection
- Chemical application technology
- Animal waste
- Pest resistance
- Soil Ecology
- Long-term health and reproductive effects of pesticide exposure
- Water supply/quantity issues including irrigation
- Riparian areas
- Water quality and monitoring
- Revised nutrient recommendations to include organic sources
- Biological and reduced risk pesticides

Pro: A shift to joint prioritization of research will ensure a more appropriate balance among agricultural production, environmental, and human health concerns. This will better reflect the public interests as opposed to the present agribusiness dominated decision making.

Pro: The process of joint priority setting will help bridge cultural differences between the agencies and institutionalize interagency staff cooperation.

Pro: After the principal of joint decision making is established, the process should be broadened to include the USF&WS and

other Federal natural resource agencies.

Con: Such a significant change in the way USDA does business will take time and resources to make workable.

a. Enforceability

General language on committing resources to environmental research needs, such as a 10% goal, is unenforceable, and will only lead to reclassification of existing research. S structured stringent process will offer more chances for enforceability through public pressure and pressure of other Federal agencies.

b. National Budgetary Implications

Negligible, this is reprogramming of existing money.

c. Political feasibility

Political feasibility is limited due to the anticipated strong opposition of the historic triad of agribusiness, the land grant university agricultural research sectors and USDA. Commodity organizations and agrichemical companies will also strongly oppose any attempt to "green" the USDA research priorities. Strong support can be expected among grass roots organizations, environmentalists, EPA, some USDA sub-units, and the USF&W Service.

d. Environmental Impact

Very significant impact on all media and aspects of agroecosystems in the long term.

e. Measurement of results

On short-term, very difficult to measure on-the-ground results. With better pesticide and nutrient use reporting, measurability would increase in the long-term.

f. Ability to implement

This is implementable - particularly with top level directives to establish a process by a certain date. Joint Espy/Browner solidarity and commitment is vital to success.

g. Synergy among options

Will positively impact other options including other legislation including the Clean Water Act and the Safe Drinking Water Act.

h. Addressing in Farm Bill

There is no present clear vehicle in the Farm Bill to address this recommendation.

i. Federal Agency Support

As a policy position, USDA will oppose any attempt to change the status quo and include EPA in its priority setting process. At the staff level there will be sympathy and unofficial support in SCS, ES, and most of CSRS. The most concern from any agency will regard the precedent that another agency is meddling with the autonomy of another agency. . . . and that they potentially may have to share their own priority setting processes.

Strong support is anticipated from the USF&WS.

j. Cost to farmers
None

k. Degree of regional flexibility

Will increase regional flexibility

l. Importance of option design

Extremely important because success could shift major funding to human and ecological health research.

2. New initiative to determine total environmental costs of off-site agricultural pollution.

Background: Issues of negative externalities have been debated by economists for years. This initiative is an attempt to begin the multi-year process of debating and resolving long term ecological cost issues. What are the true long-term societal costs of production of food and fiber.

Summary: EPA believes that unless the "total costs" of production are understood and accounted for the nation will be on a continuous pattern of fixing environmental problems often at great expense. This is an attempt to understand total costs so management and political decisions can be made with full understanding and disclosure of the impacts of various production practices. In many ways this is a model pollution prevention tool. If we understand the future long term costs of aquifer pollution, for example, we have the opportunity to manage the aquifer resource more carefully. This principle applies equally to all of our non-renewable resources.

The study would factor in other attempts to establish baseline costs including the Upper Mississippi Basin Study recommended by the President's Council on Sustainable Development. Study areas could include but would not be limited to:

- Aquifer draw down at rates in excess of recharge.
- Nitrate contamination of ground and surface water.
- Salinization of soils and other concentration of toxicants in waters (or biota) e.g. Selenium in the Tulare Basin.
- Loss of threatened and endangered species.

The study would also factor in the environmental/ecological impacts of other sectors of the economy.

EPA envisions that this effort be open to competitive bid. Cost estimates vary widely but a project of this scope could take up to seven to ten years with annual costs of $5.0 million dollars.

Pro: The single largest barrier to "total resource cost accounting" is the lack of information/agreement regarding negative externalities or hidden environmental costs of various agricultural (and other) practices. A conscious consolidated effort needs to be made to identify these total costs including human health and ecological resource depletion costs.

Pro: By tasking NRC/NAS to undertake the study, we will ensure that objective accounting methodologies will be used.

Pro: This type of initiative should be supported by the President's Council on Sustainable Development.

Con: The task of identifying total costs and then valuing them will be very expensive. Conservative estimates of the time/cost are $5.0 million a year for 7-10 years.

Con: Selection of methodologies and variables will be highly politically charged and fundamentally linked to personal values.

a. Enforceability

N/A

b. National Budgetary Implications

$5.0 million a year for 10 years.

c. Political feasibility
Environmentalists will strongly support. The agricultural industry would probably oppose because the unknowns could challenge the status-quo.

d. Environmental Impact

Potentially a major impact. could significantly change agricultural decision making in the next 20 years.

e. Measurement of results

Gives us tools and baseline to measure results

f. Ability to implement

Very feasible if done by NRC/NAS

g. Synergy among options

Profound

h. Addressing in Farm Bill

Most appropriate for the Farm Bill

i. Federal Agency Support
Opposition should be expected by USDA

j. Cost to farmers

None directly

k. Degree of regional flexibility

N/A

l. Importance of option design

Very important that designed to be performed by outside organization.

3. **Commit to encouraging private sector products, systems and services and technologies that contribute to low [environmental] impact agricultural production.**

Background: This initiative recognizes the potential of the private sector to initiate and implement agricultural pollution prevention technologies and services independent of the Land Grant Universities, USDA Extension and USDA ARS. EPA recommends market and other incentives for public sector providers that develop products services and systems that help prevent or reduce pollution from agricultural production.

Summary: Incentives can be provided to "level the playing field" in a number of ways including:

- o Create market mechanisms to increase product/service demand. Eg. Require that products/services become part of BMP recommendations.

- o Establish a research and implementation revolving fund for qualifying alternative technologies, products and services.

- o Assist in creating cooperative scouting services for small producers and for minor crops.

Pro: Private sector, market-driven incentives are more efficient and culturally acceptable than the present top down system of agricultural research.

Pro: Growers, grower organizations and processors could take greater responsibility for their own technical needs thereby privatizing functions previously provided largely by government.

Con: There is a potential for the demand for alternative systems to outstrip the supply of products and services causing temporary market disruptions.

a. Enforceability

N/A

b. National Budgetary Implications

Minor unless a revolving fund is established.

c. Political feasibility

Agriculture will largely oppose this as would the Land Grant Universities. Private sector would support.

d. Environmental Impact

Potentially very high.

e. Measurement of results

Moderately difficult to measure long-term environmental change.

f. Ability to implement

High but complicated.

g. Synergy among options

High

h. Addressing in Farm Bill

Farm Bill only

i. Federal Agency Support

USDA would oppose as privatizing their function. Other resource agencies would likely support.

j. Cost to farmers

None ... farmers would benefit in the long run.

k. Degree of regional flexibility

Privitization may better address regional needs.

l. Importance of option design

Vital to have a well thought out design

4. **Establish a coordinator for alternative farming systems under the Assistant Secretary for Research and Education at USDA. Require the office to identify pollution prevention goals and to develop and promote innovative environmentally acceptable farm production technologies in concert with EPA.**

Background: The primary thrust of USDA research education and demonstration is with production agriculture and major commodity crops and products. Alternative farming systems and sustainable agriculture are addressed by sectors of CSRS and ES. Water quality issues are a significant concern of the SCS. The small movement toward alternative (non industrial farm) systems must be given institutional parity within the Department to enable these producers to compete in the marketplace and to address environmental concerns.

Summary: Alternative farmers may be full or part time and fill the niche between organic producers and "industrial producers." Alternative systems are supported by EPA because of their potentially positive contribution to:

- Soil biology and tilth
- Threatened and endangered species
- Air and water quality

- o Soil retention

- o Human health and risk from exposure to pesticides.

Pro: Leadership in alternative agricultural production technologies should be in USDA. Such an office would help create institutional parity in USDA.

Pro: A high level focal point for sustainability issues in USDA will help the Department to set priorities with natural resource agencies and the public.

Con: The management and administrative structure of USDA does not encourage cross cutting functions. A sustainable coordinating office would impact most if not all of the USDA agencies.

a. Enforceability

N/A

b. National Budgetary Implications

Very minor

c. Political feasibility

Agriculture would probably oppose. Grass roots agriculture and organic types would support.

d. Environmental Impact

Potentially very high.

e. Measurement of results

Moderately difficult to measure long-term environmental change.

f. Ability to implement

Moderately high

g. Synergy among options

High

h. Addressing in Farm Bill

Farm Bill only

i. Federal Agency Support

USDA would oppose; Other resource agencies would likely support.

j. Cost to farmers

None ... farmers would benefit in the long run.

k. Degree of regional flexibility

High

l. Importance of option design

Vital to have a well thought out design

5. New initiative on residue monitoring, food consumption surveys, and incident poisoning monitoring.

Background: The Administration and EPA are very concerned about pesticide and other food safety issues. EPA proposes, in cooperation with the USDA and the FDA, to expand the research and data presently available on food safety, human health and nutrition to ensure that the food supply is as wholesome and safe as possible.

Summary: While much data presently exists, there is a need for a high level coordinated system of evaluation and review to establish

research priorities in the areas of food safety, human health and nutrition.

Pro: New data will improve regulatory decision-making and will improve understanding of the issues of risk from pesticide residues and the interrelationships between food safety, human health and nutrition.

Pro: Data from this effort could clarify the impact of certain pesticides and provide an incentive for the development of alternative technologies.

Con: The costs of a comprehensive effort could be prohibitive and the resulting information would not directly improve environmental conditions.

a. Enforceability

N/A

b. National Budgetary Implications

Possible major budget implications

c. Political feasibility

Limited reaction pro or con

d. Environmental Impact

No direct environmental impact. Some indirect if human health risk appears to be a factor.

e. Measurement of results

The project is a measure of residues. Environmental/ human health results are statistical.

f. Ability to implement

Can be done administratively. Should be an EPA/FDA function.

g. Synergy among options

Could give EPA tools to encourage stronger action.

h. Addressing in Farm Bill

Could be more appropriate for FFDCA or FIFRA.

i. Federal Agency Support

USDA would oppose; FDA major support.

j. Cost to farmers

None

k. Degree of regional flexibility

N/A

l. Importance of option design

N/A

EDUCATION AND EXTENSION

1. **Provide funding for state agricultural chemical use reduction programs to help achieve the Administration's 75% land management goal. Coordinate the award process with EPA and its 10 regional offices. Fund annually at $5 million per region.**

Background/Summary: The goal to have 75% of domestic crop land under plans for pest and nutrient management is laudable but needs financial support and coordination. The concept is to have funds available to:

- o Support the state planning processes, and

- o For joint EPA/USDA management to help achieve the Administration's year 2000 goal.

Pro: State programs are more likely to address specific local needs than national use reduction programs.

Pro: The administration has committed to pesticide use/risk reduction and implementation of IPM. This could be the central coordinating mechanism for that commitment.

a. Enforceability

N/A

b. National Budgetary Implications

Possible budget implications if funds are not reprogrammed from other areas.

c. Political feasibility

Funded mandates to the states are always popular.

d. Environmental Impact

Significant, but second order.

e. Measurement of results

Indirect.

f. Ability to implement

Good but will need to establish mechanism for competitive awards of funds.

g. Synergy among options

Supports local implementation as well as other options and goals.

h. Addressing in Farm Bill

Could also be addressed in other budget legislation or through administrative reprogramming of funds.

i. Federal Agency Support

USDA will likely oppose if the funds are reprogrammed.

j. Cost to farmers

None

k. Degree of regional flexibility

High - increases regional flexibility.

l. Importance of option design

Important to give funds to states and/or regions for use reduction since local efforts will likely be more effective than a national program.

Sustainable Private Nonindustrial Forestry

1995 Farm Bill

Importance of Private Nonindustrial Forest Lands

Private nonindustrial forest lands represent 55 percent of all forestland in the U.S., and 48 percent of all commercially productive forestland. They cover 217 million acres of landscape in the United States, in comparison to 382.3 million acres of crop lands (57 percent as much). Many are farmed or pastured within the same property boundary and thus also qualify as "farms" under the Farm Bill.

Increasingly, fiber from private nonindustrial forest lands replaces supplies from public and industrial lands. This trend is expected to continue in the long term. At the same time, private nonindustrial forest lands provide a growing share of environmental amenities, such as water quality and flow, wildlife habitat, climate protection, air quality and soil quality. This trend is also expected to continue.

These two trends are frequently in conflict at present, and are likely to be in greater conflict in the future without major Farm Bill assistance. Potential conflicts are heightened by a variety of factors threatening the overall productivity and abundance of private nonindustrial forest lands. Adjacent lands and watersheds are impacted by these problems as well. Major threats include:

- **conversion to nonforest uses**; 5.4 million acres were lost from 1982-92 (NRI)
- **impairment of forest stands and soils, due to a variety of causes both on-site and off-site**
- **conflicting management uses**
- **low management intensity by landowners**

Suggested Forestry Provisions Working Goals

Four general forestry goals in 1995 Farm Bill could, at least partially, address many of these problems. The forestry provisions could be designed to:

- **Maximize the number of acres of harvestable nonindustrial forests using Best Management Practices (BMP's).**
- **Maximize targeted tree planting**, with targeting criteria based on environmental and financial factors.
- **Maximize acres of targeted riparian buffers**, with targeting criteria based on environmental and financial factors.

- **Minimize the overall rate of forest conversion to nonforest uses.**

Potential Tools for Implementation

To achieve these four goals, Farm Bill forestry programs must address general issues of stewardship incentives, land set asides (including tree planting), and agricultural-forestry program interactions.

Overall, **improved targeting of resources** appears to hold the greatest potential for successfully implementing these goals and issue areas. Stronger targeting includes: 1) efficiently overlaying a set of multiple benefits (both environmental and financial) on a common landscape in order to sharply focus funds, and 2) modifying existing Farm Bill forestry programs to reflect these priorities and efficiently implement them.

Other tools of potential importance include:

- **financial incentives**, such as cost shares for BMP's
- **financial disincentives**, such as reduced support payments associated with land conversion
- **trading schemes**, particularly on a watershed basis
- **watershed approaches** for single farm and multi-farm stewardship plans

Watershed approaches may be a particularly useful organizing principle because they can:

- integrate **multiple resources, resource user needs, and adjacent property plans** on a common, manageable landscape
- enable the use of **collaborative, incentives based approaches** that allow smaller landowners to capture the synergies of larger-scale management
- use **easily defined geographical boundaries**

Potential Revisions of Existing Farm Bill Programs

Several existing Farm Bill forestry programs could, theoretically, be modified to achieve the four goals above. However, there are drawbacks to any system that attempts to achieve too many separate objectives through a single catch-all program. In some ways SIP may have fallen prey to this approach. Similarly, several land set aside programs exist that directly or indirectly involve tree planting and/or forestry, yet are poorly coordinated and confusing to landowners. These SIP and land set aside programs are not well coordinated within or across programs. And, neither appear to be coordinated with other on-farm programs that are, at least potentially, highly interactive.

A general approach to improve this situation might involve the following:

I. Consolidate Forestry Practices (BMP's) Issues Under a Streamlined, Coordinated and Highly-Targeted SIP:

- Target to the following areas:
  - riparian zones and key watersheds
  - high value-added fiber production
  - impaired forests
- Use the watershed approach as an organizing principle for targeting and planning.
- Increase acres using harvest planning and BMP implementation.
- Integrate with the President's Plan for Climate Change.
- Integrate with other tree planting programs through joint planning mechanisms (see land set aside programs below).
- Improve emphasis on water quality, particularly nonpoint source pollution prevention.
- Create programs for watershed restoration.
- Improve emphasis on wildlife habitat, particularly habitat loss prevention.
- Develop stewardship plans using a watershed approach.
- Develop better mechanisms for collaborative multi-property plans, such as trading schemes, etc.

II. Consolidate Land Set Aside and Tree Planting Programs Into a Single, Coordinated, Highly-Targeted Program:

- Replace the current "alphabet soup" of set aside programs with single program that integrates forestry and agriculture into two major categories: long-term and short-term programs.
- Make tree planting a major component of land set aside programs, with appropriate planting incentives and harvesting safeguards.
- Target to riparian zones, key watersheds, and threatened and impaired high value-added forests.
- Integrate with SIP through joint planning and cross-program incentives.
- Coordinate the design and implementation of these set aside programs with other Farm Bill agriculture incentives programs.

- Create disincentives for conversion of targeted forest lands to nonforest uses, particularly where conversion to cropland is an issue.

Ease of Implementation

Enforceability:

The programs for forestation activities suggested here are within the current scope of financial incentives programs that USDA has a great deal of experience with. USDA has a large network of extension agents for both forestry and agriculture work who can monitor activities by recipients of assistance or subsidies.

Political feasibility:

There is substantial support within the farm community for programs of this type, evidenced by the participation of farmers in previous versions of these programs. There is a much support for forestry incentives in the forestry community and cost-share incentives have been very successful in accomplishing their aims. Support from wildlife interests and the general environmental community is strong due to the impact on ecosystem improvements and availability of amenities. Congressional support for these activities is increasing. Regional targeting of programs to meet regional political and social needs is feasible.

Administrative feasibility:

Administrative capabilities exist to implement these types of programs under existing organizations and procedures. A streamlined approach could, potentially, reduce implementation costs.

Likelihood of other Federal and State Agencies supporting these options:

As these programs support other environmental goals, other agencies will likely support them. DOE will be particularly interested if forests established under such programs can be made available for bioenergy fuel stocks, a question which has yet to be answered. State wildlife agencies, the U.S. Fish and Wildlife Service, and the National Marine Fisheries Service are likely to support actions that reduce Endangered Species Act (ESA) conflicts and improve recreation and commercial activities. State forestry and pollution control agencies are likely to support any improvements to private nonindustrial forestland management that reduce their financial burdens.

Costs

National budgetary implications:

Cost-share incentives programs are quite efficient, financially. Removing land from the commodity crop base results in savings to the government in reduced subsidy payments, which can be significant. Avoidance of ESA costs are also a potential cost savings.

Cost to farmers and forest landowners:

Landowners must share the cost of establishing forests or some new management regime. However, once established, costs are minimal to non-existent, and if the program includes provisions for owners eventually harvesting the forests, farmers will eventually see significant financial gains from their investment.

Environmental benefits

Environmental impact to all media:

These programs deliver a host of benefits, including large carbon sequestration benefits, soil erosion (wind and water) reductions, water quality improvements, wildlife habitat and biodiversity improvements, ground water recharge, flood abatement, and aesthetic and recreational values.

Extent to which results can be measured:

Measurable results will be: 1) the acres of land put into forest land or under improved management, 2) the number of acres that remain in those uses after the first harvest of those trees, and 3) the acres of land using environmental management measures. In addition, water quality, wildlife populations, soil erosion rates, carbon sequestration, and fossil fuel displacement can be measured.